

AD-A108 673 AIR FORCE SYSTEMS COMMAND WASHINGTON DC
PATENT ABSTRACT DIGEST. VOLUME II-(U)
MAR 81 F A LUKASIK
UNCLASSIFIED AFSC-TR-81-66

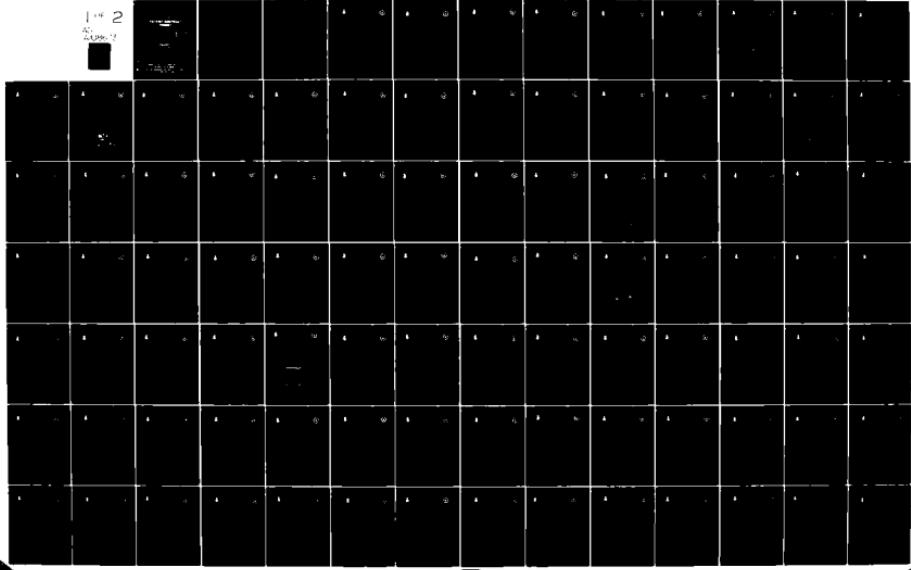
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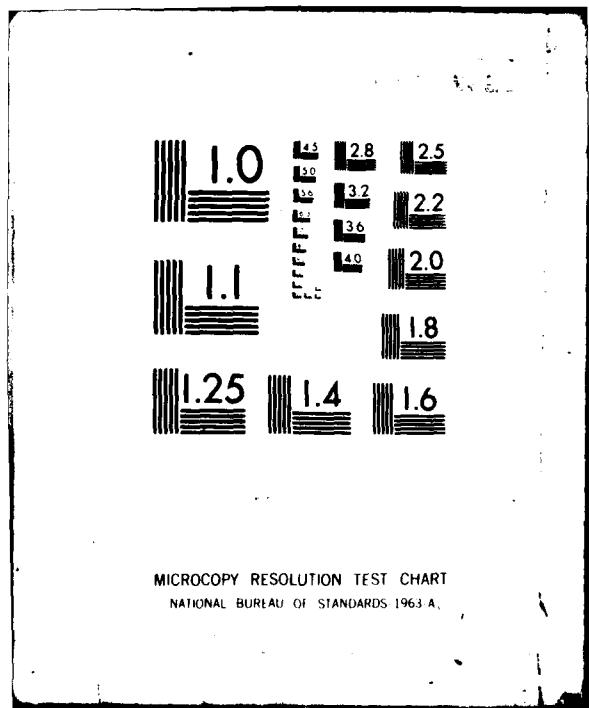
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19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Patents, Inventions, Discoveries		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) One page summaries of new technology generated under Air Force programs and protected by issued U.S. patents. Air Force owned patents are available for licensing under AFR 110-33.		

FOREWORD

THE PATENT ABSTRACT DIGEST IS DESIGNED TO PROVIDE INFORMATION ON PATENTED INVENTIONS DEVELOPED BY AIR FORCE RESEARCH AND DEVELOPMENT PROGRAMS. THE DIGEST PULLS TOGETHER ONE-PAGE SUMMARIES OF NEW TECHNOLOGY PROTECTED BY ISSUED U.S. PATENTS. THE MAJOR PURPOSE FOR PUBLISHING THE PATENT ABSTRACTS IS TO SHARE THE TECHNOLOGY WITH OTHER AGENCIES, CONTRACTORS AND MEMBERS OF THE PUBLIC. AEROSPACE SPINOFFS RARELY OCCUR AUTOMATICALLY. THEY ARE AN OUTGROWTH OF DYNAMIC INTERACTIONS OF PEOPLE . . . FROM SPACE SCIENTISTS AND INVENTORS TO THE ULTIMATE USERS IN INDUSTRY. THE PATENT ABSTRACTS ARE INTENDED TO PROVIDE A VIABLE LINK BETWEEN THE PRODUCERS OF TECHNOLOGY AND ITS POTENTIAL USERS, IN EFFECT "CATALYZING" THE TRANSFER PROCESS.

NEW GOVERNMENT REGULATIONS ARE DESIGNED TO PROMOTE FASTER COMMERCIAL USE OF GOVERNMENT GENERATED TECHNOLOGY BY ENABLING PATENT LICENSES TO BE GRANTED. AIR FORCE REGULATION 110-33 PRESCRIBES THE POLICIES, ADMINISTRATIVE REQUIREMENTS, PROCEDURES, TERMS AND CONDITIONS FOR LICENSING AIR FORCE INVENTIONS. SECTION C, PARAGRAPH 11, REQUIRES THE AIR FORCE TO PUBLISH A LIST OF INVENTIONS AVAILABLE FOR LICENSING IN THE FEDERAL REGISTER, THE OFFICIAL GAZETTE OF THE U.S. PATENT AND TRADEMARK OFFICE, AND AT LEAST ONE OTHER PUBLICATION. WE CONCLUDED THAT BARE NOTIFICATION BY TITLE IN THE FEDERAL REGISTER WOULD NOT GO VERY FAR IN STIMULATING COMMERCIAL USERS OF AIR FORCE GENERATED INVENTIONS. THE PATENT ABSTRACT IS THE NEXT STEP UP THE PROMOTIONAL LADDER SUGGESTED IN THE 1971-1972 ANNUAL REPORT ON GOVERNMENT PATENT POLICY AND AIR FORCE REGULATION 110-33.

RECENT LEGISLATION HAS ADDED ADDITIONAL GOVERNMENT EMPHASIS ON THE DISSEMINATION OF GOVERNMENT GENERATED TECHNOLOGY. WE BELIEVE THAT DISSEMINATION OF THE RESULTS OF AIR FORCE R&D PROGRAMS DESCRIBED IN THESE ISSUED U.S. PATENTS WILL HELP REDUCE THE POSSIBILITY OF "RE-INVENTING THE WHEEL" AND THUS SAVE GOVERNMENT R&D FUNDS.

SIGNED

CHESTER D. TAYLOR, JR.
BRIGADIER GENERAL, USAF
STAFF JUDGE ADVOCATE



PATENT
ABSTRACT

FROM THE AIR FORCE SYSTEMS COMMAND

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United States Patent [19]

Barron et al.

[11] **4,151,539**
[45] **Apr. 24, 1979**

[54] JUNCTION-STORAGE JFET
BUCKET-BRIGADE STRUCTURE

3,918,081 11/1975 Sangster 357/24
4,012,759 3/1977 Easer 357/24
4,032,952 6/1977 Ohba et al. 357/24

[75] Inventors: Mark B. Barron, Camillus; Walter J. Butler, Scotia, both of N.Y.

FOREIGN PATENT DOCUMENTS

2504088 8/1975 Fed. Rep. of Germany 357/24

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

OTHER PUBLICATIONS

Schuermeyer et al., "New Structures for Charge-Coupled Devices", Proc. IEEE, vol. 60 (11/72) pp. 1444-1445.

[21] Appl. No.: 864,065

Primary Examiner—William D. Larkins
Assistant Examiner—Gene M. Munson
Attorney, Agent, or Firm—Joseph E. Rusz; Robert Kern Duncan

[22] Filed: Dec. 23, 1977

[57] ABSTRACT

[51] Int. Cl. 2 H01L 29/78; H01L 29/80;

The novel structure disclosed comprises an n-type epitaxial layer on a p- type substrate with p+ type top gates diffused into the epi-layer and p+ buried gates aligned with the source side of the top gates. The top-gate diffusion extends far into the drain region.

G11C 19/28

1 Claim, 3 Drawing Figures

[52] U.S. Cl. 357/24; 357/22;

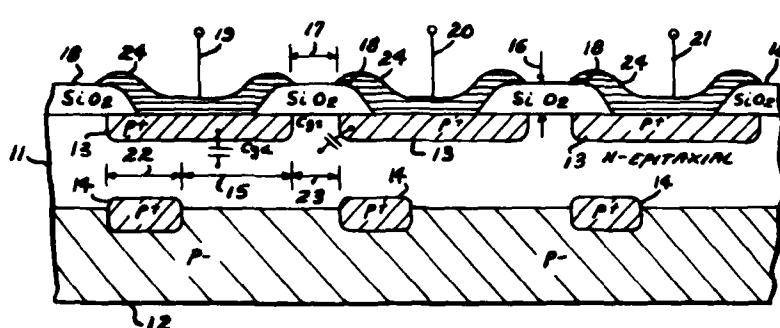
307/221 D

[58] Field of Search 357/22, 24; 307/221 D

[56] References Cited

U.S. PATENT DOCUMENTS

3,453,504	7/1969	Compton et al.	357/22
3,663,873	5/1972	Yagi	357/22
3,739,240	6/1973	Krambeck	357/24
3,784,847	1/1974	Kurz et al.	357/24
3,825,996	7/1974	Barron et al.	357/24



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United States Patent [19]

Harris et al.

[11] **4,154,415**

[45] **May 15, 1979**

[54] MODULATING VERNIER FLAP CONTROL SYSTEM

[75] Inventors: Charles V. Harris, Cerritos; George A. Schlamert, Tustin, both of Calif.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 366,144

[22] Filed: Dec. 30, 1977

[51] Int. Cl.² B64C 13/02

[52] U.S. Cl. 244/83 C; 74/471 R; 74/491; 74/534; 244/83 F; 244/83 K; 244/211

[58] Field of Search 244/83 C, 83 F, 83 G, 244/83 H, 83 K, 83 E, 210, 211, 213, 75 R, 85; 74/533, 534, 471 R, 491; 200/61.54, 56 R; 116/124 R, 124 A, 124 C

[56] References Cited

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| 1,987,066 | 1/1935 | Kingston | 244/83 F X |
| 2,279,612 | 4/1942 | Blass et al. | 244/83 R |
| 2,609,165 | 9/1952 | Hill | 244/83 X |
| 2,665,084 | 1/1954 | Feehey et al. | 74/471 X |

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2,774,555	12/1956	Crawford et al.	244/85 X
2,974,908	3/1961	Platt	244/83 J
3,358,949	12/1967	Harrison	244/83 E
3,636,321	1/1972	Kirschner	244/181 X
3,681,580	8/1972	Gwathmey et al.	244/183 X
3,710,644	1/1973	Downing et al.	74/533 X
3,822,047	7/1974	Schmidt	244/181
3,850,388	11/1974	Olcott et al.	244/75 R

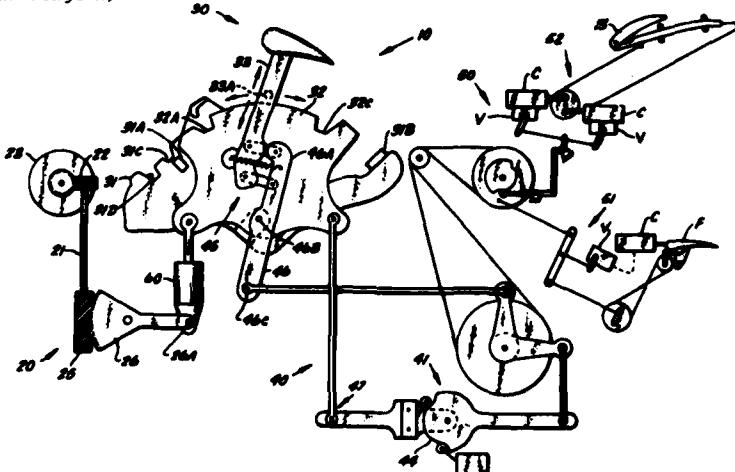
Primary Examiner—Barry L. Kelmachter

Attorney, Agent, or Firm—Joseph E. Rusz; Arsen Tashjian

[57] ABSTRACT

A slot and modulatable flap control system for an aircraft having slats in the leading edge of the wing and having flaps in the trailing edge of the wing. A detent pin on a control handle, and any one of four detent slots on a detent crank, can be engaged to selectively, and automatically, set the flaps and the slats (because of the cooperative action of other constituent components of the control system) in optimum positional relationship for takeoff/"go-around," cruising, approach, and landing of aircraft. The control system is ideally suited for aircraft used in "short takeoff-and-landing" situations.

3 Claims, 7 Drawing Figures



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United States Patent [19]

Goldie et al.

[11] 4,155,054
[45] May 15, 1979

[54] MICROWAVE YIG POWER LIMITER USING
ELECTRICALLY THIN IRIS

[56]

References Cited

U.S. PATENT DOCUMENTS

3,040,276 6/1962 Tramburlo et al. 333/24.2
3,480,888 11/1969 Elliott 333/24.2 X
3,500,256 3/1970 Carter et al. 333/17 L

[75] Inventors: Harry Goldie, Randallstown; Steven

[57]

N. Stitzer, Ellicott City, both of Md.

Primary Examiner—Paul L. Gensler

[73] Assignee: The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.

Attorney, Agent, or Firm—Joseph E. Rusz; Robert Kern

Duncan

[21] Appl. No.: 854,449

ABSTRACT

[22] Filed: Nov. 23, 1977

A ferrimagnetic sphere that is biased to the subsidiary resonance mode and placed within a microwave slotted resonant structure functions as a frequency selective microwave power limiter. When the power level of a signal at the input port exceeds a threshold level, the device prevents the power level at the output port from increasing further. A weak signal present simultaneously passes with relatively little attenuation if it is slightly offset in frequency.

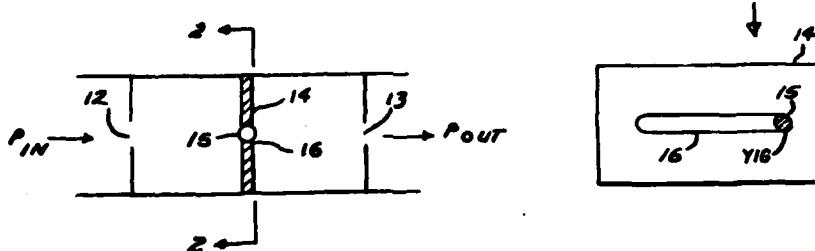
[51] Int. Cl.² H01P 1/22

6 Claims, 7 Drawing Figures

[52] U.S. Cl. 333/17 L; 333/248;

H01P/3/04

[58] Field of Search 333/17 L, 24.2, 73 W



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United States Patent [19]

Pickett et al.

[11] 4,155,265
[45] May 22, 1979

[54] INTERFACE SHEAR TRANSDUCER

[56] References Cited

U.S. PATENT DOCUMENTS

2,741,120 4/1956 Ormsby, Jr. 73/141 A
3,576,128 4/1971 Lockery 73/141
3,602,866 8/1971 Saxe 73/88.5 X
3,673,861 7/1972 Handy 73/101

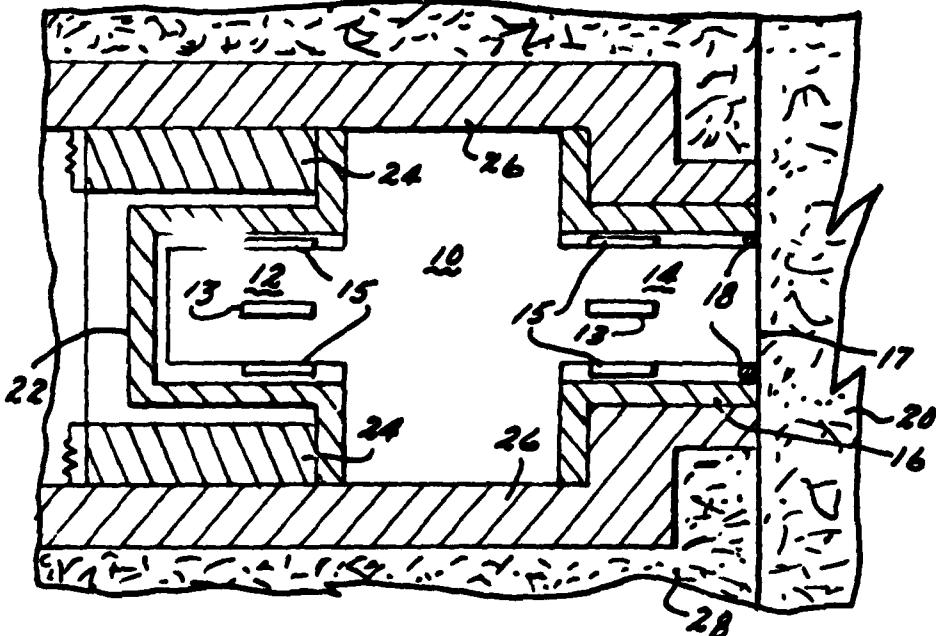
Primary Examiner—Charles Gorenstein

Attorney, Agent, or Firm—Joseph E. Rusz; Henry S. Miller

[57] ABSTRACT

A shear transducer having two cylindrical bending beams with two full strain gage bridges so arranged to cancel acceleration induced by forces in the axis of interest.

7 Claims, 4 Drawing Figures



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United States Patent [19]

Mihm

[11] 4,155,286
[45] May 22, 1979

- [54] WEDGE CLAMP FOR MISSILE LAUNCHER
[76] Inventor: John J. Mihm, 1300 Kirby NE,
Albuquerque, N. Mex. 87112
[21] Appl. No.: 856,361
[22] Filed: Dec. 1, 1977
[51] Int. Cl.² F4F 7/00
[52] U.S. Cl. 89/1.819; 89/1.5 G
[58] Field of Search 89/1.819, 1.812, 1.806,
89/1.8, 1.5 G; 24/262, 263 A

- 3,228,297 1/1966 Kossan et al. 89/1.806
3,267,809 8/1966 Sikora 89/1.819
3,967,529 7/1976 Ingle et al. 89/1.819

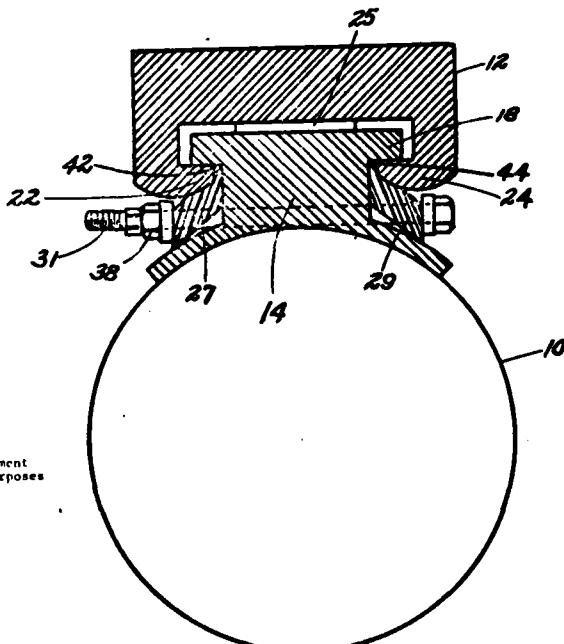
Primary Examiner—David H. Brown
Attorney, Agent, or Firm—Joseph E. Rusz; Richard J.
Killoren

[57]

ABSTRACT

An adjustable clamp for a missile launcher system having a pair of semi-resilient wedge members which fit between the missile hanger lugs and launcher rail and are drawn into the gap by means of a pair of plate members and a pair of bolts. The Teflon wedges fill the gap between the missile hanger lugs and the launcher rail and reduce vibration during captive flight and protect the rails against damage.

5 Claims, 6 Drawing Figures



RIGHTS OF THE GOVERNMENT

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United States Patent [19]

Murawski

[11] 4,155,308
[45] May 22, 1979

[54] SABOT FOR SIMULATION TESTING

[75] Inventor: Paul M. Murawski, Blue Island, Ill.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 847,952

[22] Filed: Nov. 2, 1977

[51] Int. Cl.² F42B 13/16

[52] U.S. Cl. 102/93

[58] Field of Search 102/93, DIG. 7

[56] References Cited

U.S. PATENT DOCUMENTS

4,083,306 4/1978 Woodring 102/DIG. 7

FOREIGN PATENT DOCUMENTS

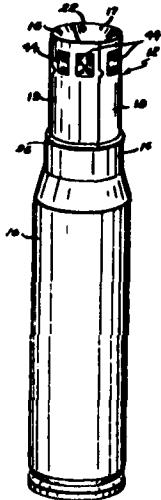
1262830 3/1968 Fed. Rep. of Germany 102/93

Primary Examiner—Verlin R. Pendegras
Attorney, Agent, or Firm—Joseph E. Rusz; Richard J. Killoren

[57] ABSTRACT

A sabot, having four quadrant sections, for use in testing of impact damage of metal fragment-type products. The quadrant sections include molded alignment guides and a depression which forms a central cavity for holding payloads. Recesses are provided in the quarter sections to reduce weight. An external gas plug flare is provided on the external surface of the sabot. The sabot has a conical recess at the forward end with a hole into the interior of the sabot to enhance separation of the quadrant sections after the sabot has left the gun barrel.

1 Claim, 11 Drawing Figures



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JAT 00098

AFSC — Andrews AFB Md 1978



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United States Patent [19]

Sarok, Jr.

[11] **4,155,579**
[45] **May 22, 1979**

[54] ROTATING DETENT LATCH MECHANISM
[75] Inventor: John S. Sanok, Jr., Arnold, Md.
[73] Assignee: The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.
[21] Appl. No.: 840,332
[22] Filed: Oct. 7, 1977
[51] Int. Cl.² E05C 13/00
[52] Inv. No. 222-222

[56] References Cited
U.S. PATENT DOCUMENTS

2,046,790	7/1936	Phillips	292/179
3,536,349	10/1970	Gardner et al.	292/179 X
3,891,253	6/1975	Renell	292/336.1

FOREIGN PATENT DOCUMENTS

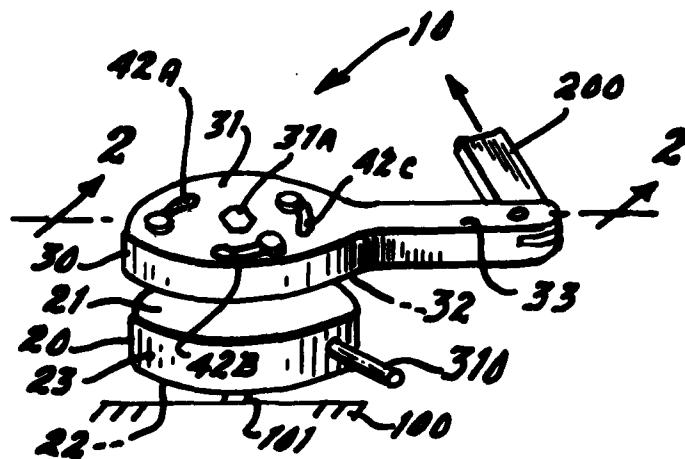
19262 of 1892 United Kingdom 292/206

*Primary Examiner—Richard E. Moore
Attorney, Agent, or Firm—Joseph E. Rusz; Arsen
Tashjian*

ABSTRACT

A compact, easily fabricated mechanism which provides a latching and unlatching function in a small volume and through a restricted access. The mechanism offers a positive detent for the latch position, and a forced movement to the unlatched position. It is operable by access through a single hole by use of a simple hexagonal stock tool. For remote actuation the mechanism provides a reliable one-time-only unlatching motion.

4 Claims, 6 Drawing Figures



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United States Patent [19]

Schlossberg

[11] **4,155,628**
[45] **May 22, 1979**

[54] **OPTICAL MULTIPLEXER/DEMULTIPLEXER WITH INTERFEROMETER ELEMENTS**

[76] Inventor: Howard R. Schlossberg, 9 Turning Mill Rd., Lexington, Mass. 02173

[21] Appl. No.: 898,068

[22] Filed: Apr. 20, 1978

[51] Int. Cl. 2 G02B 27/14

[52] U.S. Cl. 350/174; 350/171

[58] Field of Search 350/171, 174, 169, 163; 356/106 R

[56] **References Cited**

U.S. PATENT DOCUMENTS

3,879,109 4/1975 Thomas 350/174

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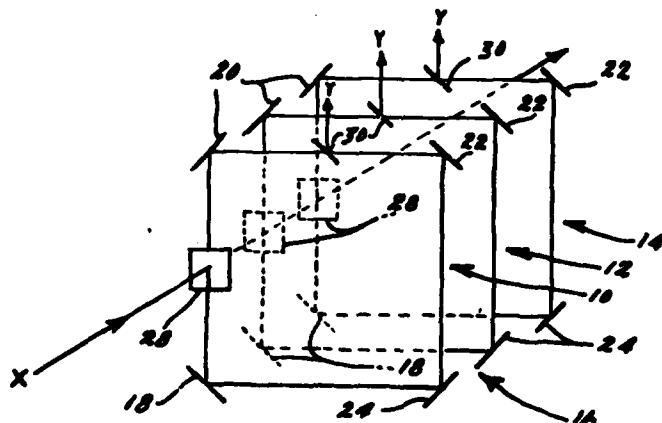
App. Optics, vol. 16, No. 2, Feb. 1977, pp. 263-265.
Modern Communications Principles, Stein & Jones, pub. McGraw Hill, 1967, pp. 211-215.
A Quasi-Optical Radiometer, pp. 106-107, and Quasi-Optical Receiver Design, J. J. Gustinic, 13121 Mindanao Way, Marina Del Ray, CA. 90291.

Primary Examiner—Jon W. Henry
Attorney, Agent, or Firm—Joseph E. Rusz; Jacob N. Erlich

[57] **ABSTRACT**

A multiplexer/demultiplexer having a series of novel interferometer elements optically aligned with one another in a stacked relationship. Each of the interferometer elements being made up of a plurality of reflective elements forming an optical path therebetween and a pair of beam splitters for directing a beam of radiant energy into or out of the optical path. The optical path of each interferometer element being defined for resonance at a different frequency whereby in operation as a multiplexer a plurality of beams of radiant energy, each of a predetermined frequency, emerge from the multiplexer/demultiplexer as a single beam of radiant energy having a multitude of frequencies or in operation as a demultiplexer a single beam of radiant energy having a multitude of frequencies emerges from the multiplexer/demultiplexer as a plurality of beams radiant energy, each at a preselected frequency.

10 Claims, 5 Drawing Figures



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United States Patent [19]

Honeycutt, Jr. et al.

[11] 4,155,780
[45] May 22, 1979

- [54] METHOD FOR PRESTRESSING TURBINE DISKS
[75] Inventors: Fred L. Honeycutt, Jr., Lake Park; Myron C. Starr, Jupiter, both of Fla.
[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
[21] Appl. No.: 866,185
[22] Filed: Dec. 30, 1977
[51] Int. Cl.² C22F 1/00
[52] U.S. Cl. 148/13.1; 148/14
[58] Field of Search 148/13.1, 13.2, 14, 148/149, 13, 134

[56] References Cited
U.S. PATENT DOCUMENTS

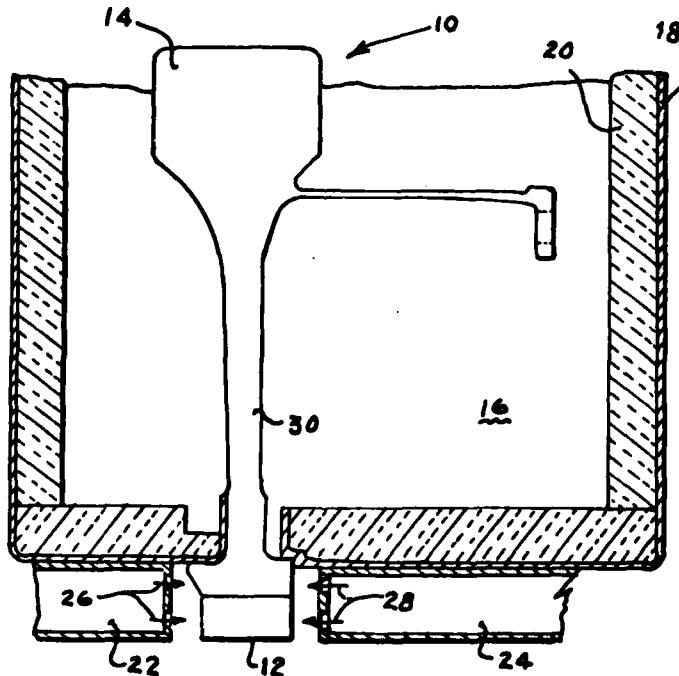
3,558,367 1/1971 Eck 148/149

Primary Examiner—R. Dean
Attorney, Agent, or Firm—Joseph E. Rusz; Henry S. Miller, Jr.

[57] ABSTRACT

A method for adding a residual compressive stress to the rim of a turbine disk by heating the disk to a uniform high temperature, then insulating the rim from the remainder of the disk and cooling to a temperature wherein the rim yields in tension.

1 Claim, 1 Drawing Figure



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United States Patent [19]

Willmore .

[11] 4,159,454

[45] Jun. 26, 1979

[54] PLUG-IN FILTER NETWORK FOR
SEPARATING A COMMUNICATION
FREQUENCY INTO DISCRETE
FREQUENCY CHANNELS

[75] Inventor: Robert R. Willmore, Millersville,
Md.

[73] Assignee: The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.

[21] Appl. No.: 866,125

[22] Filed: Dec. 30, 1977

[51] Int. Cl.² H01P 1/20
[52] U.S. Cl. 333/20; 325/3;

333/1.1; 333/110; 333/202

[58] Field of Search 333/1, 1.1, 2, 6, 28 R,
333/73 R, 73 W, 20; 328/140, 167; 325/3, 4;
179/15 R, 15 AD, 15 BD

[56] References Cited

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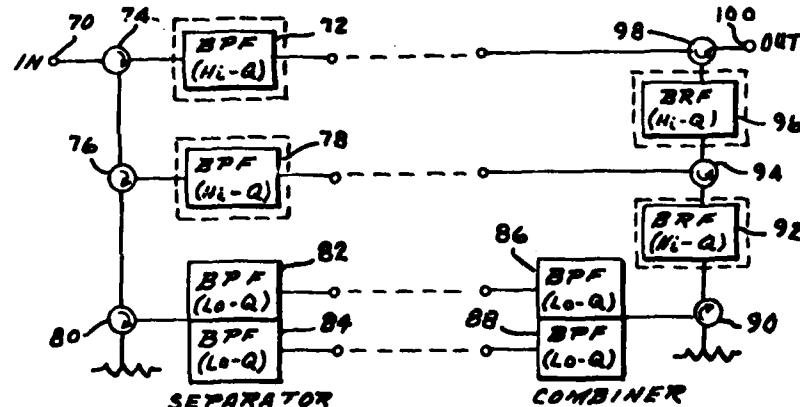
4,109,202 8/1978 Kudsia et al 333/1.1 X

Primary Examiner—Paul L. Gensler
Attorney, Agent, or Firm—Joseph E. Rusz, Henry S.
Miller

[57] ABSTRACT

A filter network for separating a transmitted communication frequency into discrete channels. A separator, exemplified by a triplexer, includes a pluggable mid-range high Q bandpass filter and a diplexer of low Q bandpass filters. Circulators receive signals reflected from the high Q filter and pass them to the low Q filters. A combiner circuit takes the attenuated signal from the low Q filters and sends it through a circulator to a high Q plug in filter where the signal passes through a circulator where it is combined with the signal from the high Q filter of the separator as output.

2 Claims, 9 Drawing Figures



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United States Patent [19]

Phillips

[11] 4,157,231
[45] Jun. 5, 1979

[54] HYDRAULIC DRILL UNIT

[75] Inventor: Joseph L. Phillips, Beaux Arts Village, Wash.
[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
[21] Appl. No.: 837,330
[22] Filed: Sep. 27, 1977
[51] Int. Cl. B23B 35/00; B23B 47/18
[52] U.S. Cl. 408/1 R; 408/9;
408/11; 408/13; 408/16
[58] Field of Search 408/1, 9, 11, 13, 16;
82/2 B, 1 C

[56] References Cited

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3,174,367 3/1965 Lukens 82/2 B
3,259,023 7/1966 Rieger et al. 408/9
3,754,487 8/1973 Nachigal 82/1 C

Primary Examiner—Leonidas Vlachos
Attorney, Agent, or Firm—Joseph E. Rusz; Richard J. Killoren

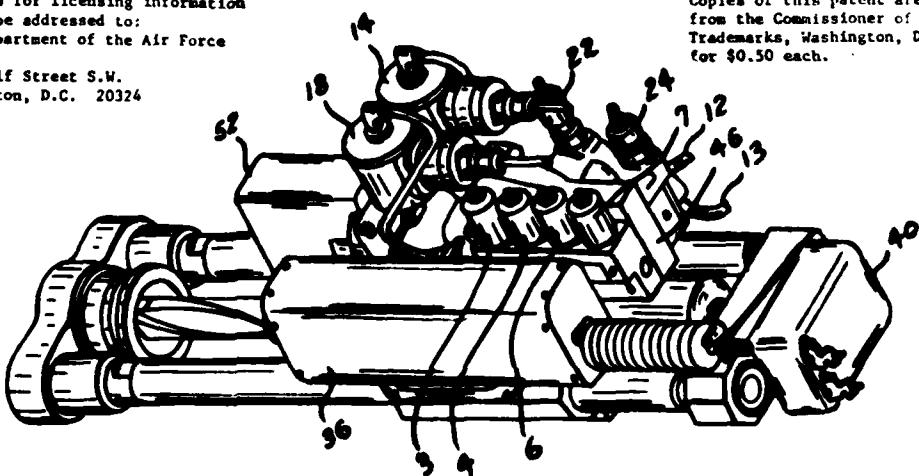
[57] ABSTRACT

A hydraulic drill unit for drilling multimaterial, thick layer stock having a conventional hydraulic drill modified to have its feed controlled by a servo valve and its spindle speed controlled by a servo valve. A linear encoder is attached to the drill to provide an indication

of drill position. The linear encoder provides 20,000 forward and reverse pulses per inch, depending upon the direction of travel, which are used to determine net feed rate. The net feed rate signal is compared with a command feed rate to control the feed servo valve. A magnetic pickup is used to provide a pulse signal proportional to RPM. This signal is compared with a command speed signal to control the spindle speed servo valve. Differential pressure transducers are used to measure pressure across the hydraulic feed piston and the hydraulic drill motor to provide signals which can be used as indications of chip packing or a dull drill. Displays are provided to indicate Torque, Thrust, RPM, Inches of travel per revolution and relative displacement of the drill. These displays are used for the manual control of the drill. Torque, Thrust, RPM and absolute displacement information is supplied to a computer for the automatic operation of the hydraulic drill. Since optimized speeds and feeds are generally known for specific drill diameters and materials, this information has been programmed into the computer to provide the command feed and command speed levels for the various materials in a stack to provide the error signals for controlling the feed and speed servo valves. Torque and Thrust buildup are used by the computer for indications of chip packing or dull drill. Four solenoid valves are used to provide rapid advancement and rapid retraction of the drill.

6 Claims, 17 Drawing Figures

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R&D RECORD (Patent Abstract)

AFSC — Andrews AFB MD 1978



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United States Patent [19]

Dion

[11] 4,156,878
[45] May 29, 1979

[54] WIDEBAND WAVEGUIDE LENS

[75] Inventor: Andre R. Dion, Concord, Mass.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 872,203

[22] Filed: Jan. 25, 1978

[51] Int. Cl.² H01Q 15/04

[52] U.S. Cl. 343/909

[58] Field of Search 343/753, 754, 755, 909,
343/910, 854

[56] References Cited

U.S. PATENT DOCUMENTS

2,607,009 8/1952 Affel 343/753
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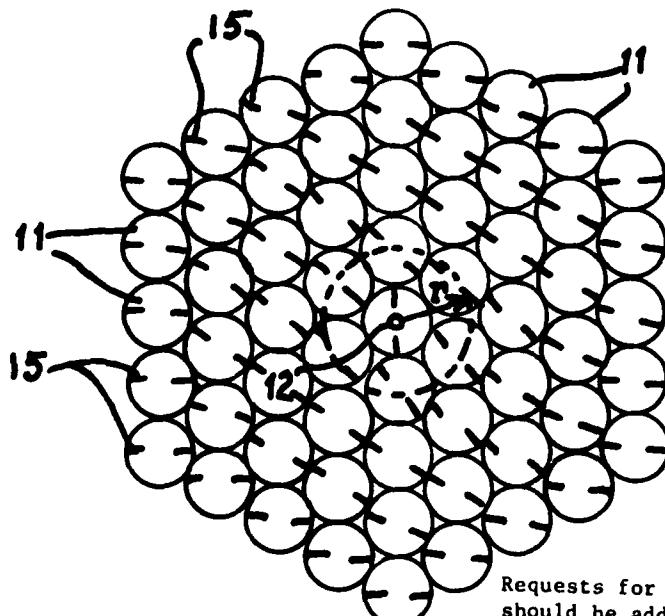
838333 5/1952 Fed. Rep. of Germany 343/909

Primary Examiner—Eli Lieberman
Attorney, Agent, or Firm—Joseph E. Rusz; Willard R. Matthews, Jr.

[57] ABSTRACT

A waveguide lens having improved efficiency and bandwidth characteristics is realized by appropriately combining the waveguide element array configuration of a conventional zoned waveguide lens with the phase shifting means of a constant thickness variable phase shift type waveguide lens. The length of each waveguide element and the phase shift required of its phase shifting means are functions of the waveguide elements radial distance from the lens axis. Design equations for determining waveguide element length and phase shift values are developed using both single and double frequency design procedures.

2 Claims, 10 Drawing Figures



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United States Patent [19]

Jones

[11] 4,156,514
[45] May 29, 1979

[54] CYLINDER SUPPORT ASSEMBLY

[75] Inventor: Larry R. Jones, Norwalk, Calif.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 399,462

[22] Filed: Mar. 23, 1978

[51] Int. Cl. E21F 17/02
[52] U.S. Cl. 248/58; 248/62
[58] Field of Search 248/54 R, 58, 60, 62
..... 248/74 R, 74 A, 74 B, 358 A

[56]

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187,587	6/1916	White	248/62
489,481	11/1949	Chester	248/54 E
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1299471 7/1969 Fed. Rep. of Germany 248/62

Copies of this patent are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231 for \$0.50 each.

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303429 8/1968 Sweden 248/358 A

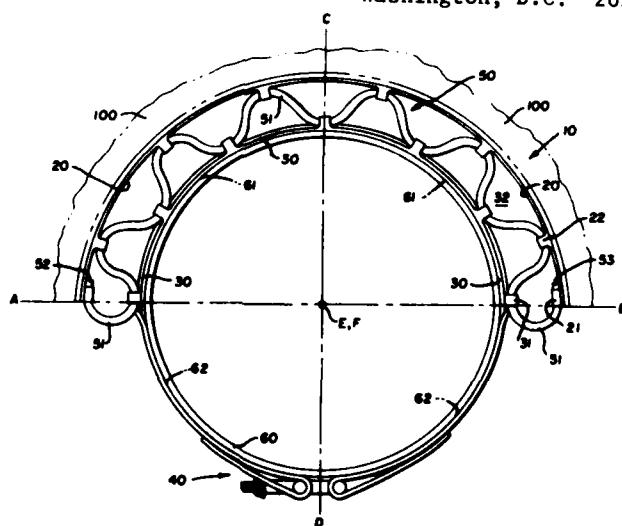
Primary Examiner—Robert A. Haber
Attorney, Agent, or Firm—Joseph E. Rusz; Arsen Tashjian

[57] ABSTRACT

The assembly releasably holds a hollow cylinder, or the like, from an overhead support in a stable condition, even during and after the hanging cylinder has expanded lengthwise. The preferred embodiment of the assembly includes: a first half-ring shaped member of sheet metal attached to the overhead support; a second half-ring shaped member of sheet metal disposed along, and in abutting contact with, the upper external surface of, the cylinder; a band clamp encircling and clamping the second half-ring member to the cylinder; and, a wire rope cable that is connected alternately, and recurringly, to the first and second half-ring members. The assembly is simple in structure, light in weight, and inexpensive to fabricate and to install.

2 Claims, 4 Drawing Figures

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United States Patent [19]

[11] 4,159,497

Hilliard, Jr. et al.

[45] Jun. 26, 1979

[54] SWITCH DEBOUNCE CIRCUIT

[75] Inventors: Milton E. Hilliard, Jr., Millers; Daniel J. Provine, Severna Park, both of Md.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 880,910

[22] Filed: Feb. 23, 1978

[51] Int. Cl. 2 H02H 7/20

[52] U.S. Cl. 361/2; 307/247 A

[58] Field of Search 361/2; 307/247 A

[56] References Cited

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3,866,092 2/1975 Burns 361/2
4,045,692 8/1977 Morokawa et al. 307/247 A X

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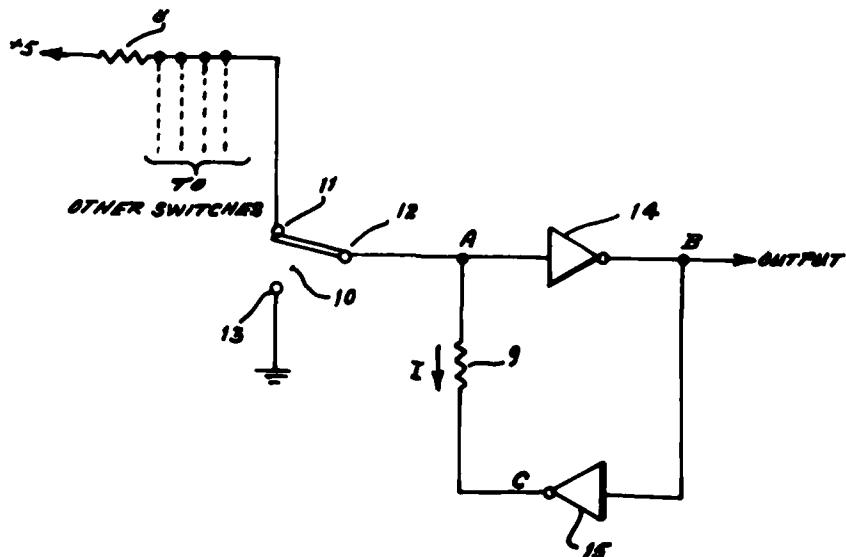
Primary Examiner—Harry E. Moose, Jr.
Attorney, Agent, or Firm—Joseph E. Rusz; George Fine

[57] ABSTRACT

A switch debounce circuit buffers the mechanical contacts of a double throw single pole switch into digital logic. It is essentially an active debounce circuit requiring only one wire from the switch to the circuit. The circuit includes a pair of oppositely connected inverting logic amplifiers with a resistor coupled between the output of one amplifier and the input of the second amplifier. The input from the switch is connected to the same leg of the circuit as a resistor and the output is taken from an opposite leg connecting the output of the second amplifier to the input of the first amplifier. The propagation of logic signals is effected by changing the state of the switch but contact bounce does not effect the logic.

2 Claims, 1 Drawing Figure

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United States Patent [19]

Butler et al.

[11] 4,161,041

[45] Jul. 10, 1979

[54] PSEUDO RANDOM NUMBER GENERATOR APPARATUS

[58] Field of Search 365/244, 78, 73, 76,
365/77

[75] Inventor: Eric W. Butler, Severna Park;
Clinton W. Meekins, III, Millersville,
both of Md.

Primary Examiner—Terrell W. Fears
Attorney, Agent, or Firm—Joseph E. Rust; William
Stephanianen

[73] Assignee: The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.

[37] ABSTRACT
An improved pseudo random number generator apparatus utilizing a programmable read only memory to reduce autocorrelation magnitudes by mapping the maximal length shift register states into the final output states.

[21] Appl. No.: 949,198

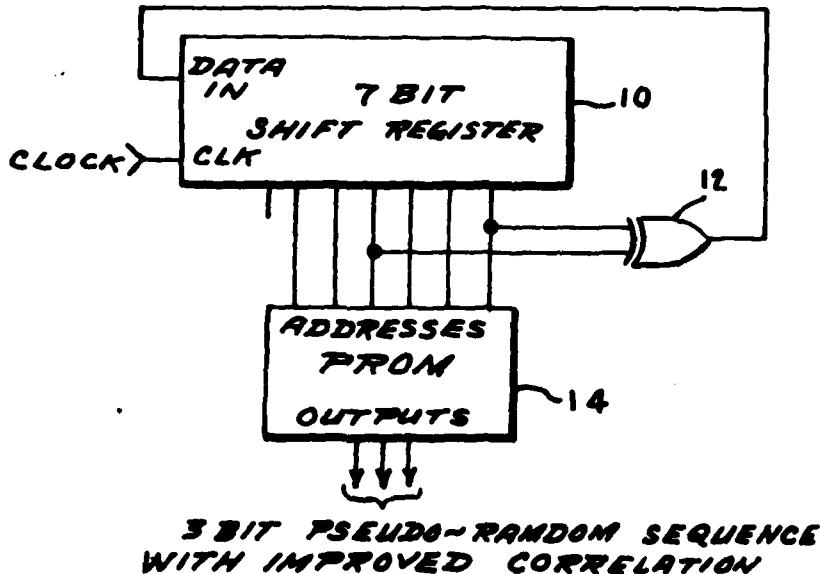
7 Claims, 9 Drawing Figures

[22] Filed: Oct. 6, 1978

[51] Int. Cl.² G11C 13/00
[52] U.S. Cl. 365/244; 365/73

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United States Patent [19]

Quinlan et al.

[11] 4,161,434

[45] Jul. 17, 1979

[54] METHOD FOR SEPARATING
TRIALUMINUM NICKELIDE FIBERS FROM
AN ALUMINUM MATRIX

[75] Inventors: Kenneth P. Quinlan, Newton; Joseph J. Hatta, Groton, both of Mass.

[73] Assignee: The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.

[21] Appl. No.: 950,658

[22] Filed: Oct. 12, 1978

[51] Int. Cl.² C25F 5/00; C25F 3/00;
C25F 3/04

[52] U.S. Cl. 204/146; 204/129.8

[58] Field of Search 204/146, 129.75, 140,
204/141.5, 129.8

[56] References Cited

U.S. PATENT DOCUMENTS

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4,100,044	7/1978	Hussey et al.	204/146

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Transactions of the Metallurgical Society of Aime, vol. 239, Jun. 1967, p. 845.

Transactions of the Metallurgical Society of Aime, vol. 233, Feb. 1965, p. 335.

Primary Examiner—T. M. Tufariello

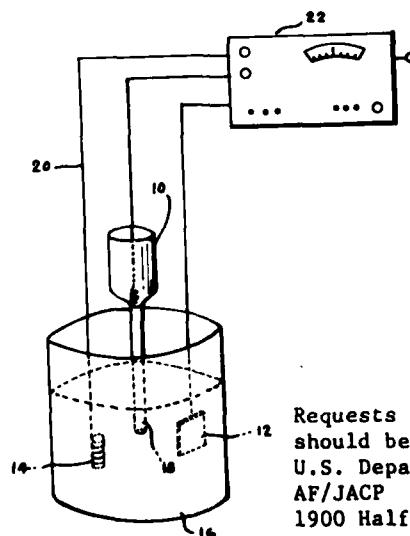
Attorney, Agent, or Firm—Joseph E. Rusz; William J. O'Brien

[57] ABSTRACT

Electrolytic production of Al₃Ni fibers using a potassium hydroxide electrolyte.

3 Claims, 3 Drawing Figures

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United States Patent [19]

Hutta et al.

[11] 4,161,826
[45] Jul. 24, 1979

[54] METHOD OF DEAGGLOMERATION OF
ALUMINUM POWDER

[75] Inventors: Joseph J. Hutta, Groton; Kenneth P. Quinlan, Newton, both of Mass.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 884,881

[22] Filed: Mar. 9, 1978

[51] Int. Cl.² F26B 7/00

[52] U.S. Cl. 34/12; 34/9

[58] Field of Search 34/9, 12

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[56]

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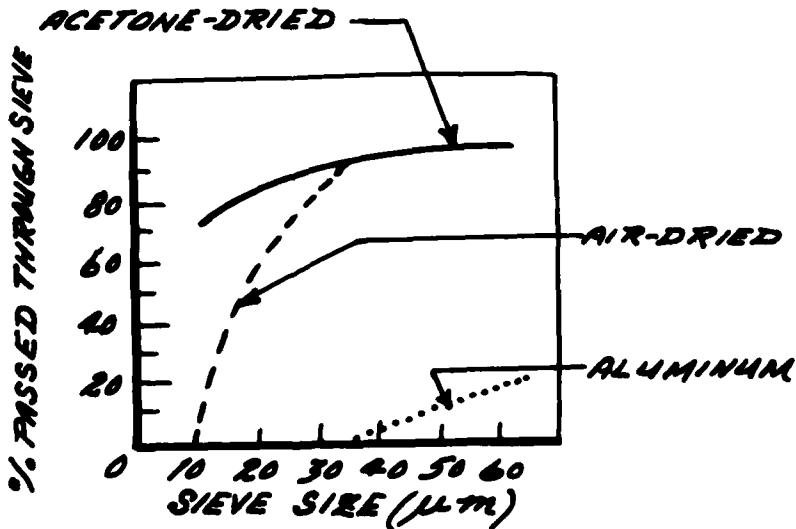
Primary Examiner—John J. Camby
Attorney, Agent, or Firm—Joseph E. Rusz; William J. O'Brien

[57] ABSTRACT

A method for deagglomerating finely divided aluminum metal powders by allowing said metals powders to remain in contact with water heated to room temperature for approximately 30 hours.

2 Claims, 1 Drawing Figure

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United States Patent [19]

Specker et al.

[11] **4,161,874**
[45] **Jul. 24, 1979**

**[54] HEAD AND NECK IMPACT
MEASUREMENT SYSTEM**

[75] Inventors: Lawrence J. Specker, Layton, Ohio;
Austin M. Higgins, Lexington, Ky.;
James W. Brinkley, Kettering, Ohio

[73] Assignee: The United States of America, as
represented by the Secretary of the
Air Force, Washington, D.C.

[21] Appl. No.: 932,071

[22] Filed: Aug. 8, 1978

[31] Int. Cl.: G01M 7/00; G01P 15/00

[52] U.S. Cl.: 73/12; 73/432 SD

[58] Field of Search: 73/12, 432 SD, 663

[56] References Cited

U.S. PATENT DOCUMENTS

3,841,163 10/1974 Daniel 73/432 SD

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Primary Examiner—James J. Gill

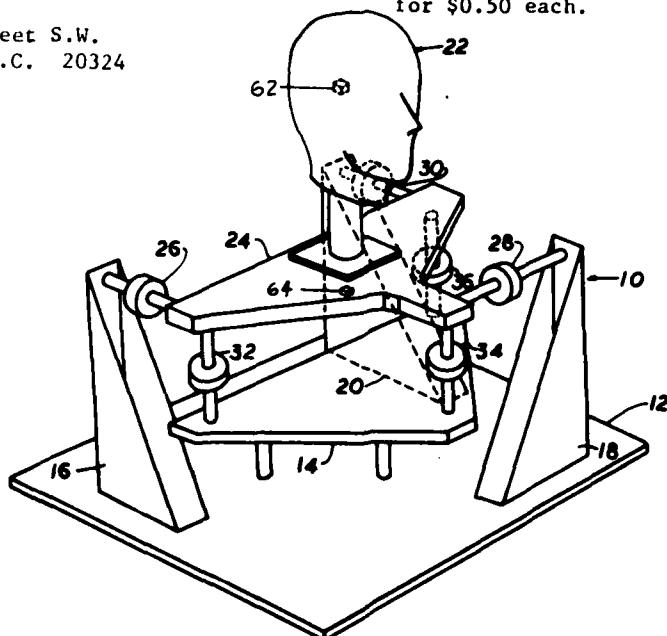
**Attorney, Agent, or Firm—Joseph E. Rust; Richard J.
Killoren**

[57] ABSTRACT

A system for measuring head and neck impact forces, having a movable plate member with an anthropometric dummy head and neck member secured to the plate member. Three force measuring cells are positioned in a horizontal plane and are connected between the movable plate member and three column members. Three vertical force measuring cells are positioned between a support plate and the movable plate member. High frequency response triaxial accelerometers are mounted at the center of gravity of the dummy head and neck member and on the movable plate member adjacent the attachment of the dummy head and neck member.

.2 Claims, 4 Drawing Figures

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United States Patent [19]

Eden et al.

[11] 4,162,203
[45] Jul. 24, 1979

[54] METHOD OF MAKING A NARROW-BAND
INVERTED HOMO-HETEROJUNCTION
AVALANCHE PHOTODIODE

[75] Inventors: Richard C. Eden, Thousand Oaks; Kenichi Nakano, N. Hollywood, both of Calif.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 920,741

[22] Filed: Jun. 28, 1978

Related U.S. Application Data

[62] Division of Ser. No. 808,496, Jun. 21, 1977, Pat. No. 4,110,778.

[51] Int. Cl. H01L 31/18

[52] U.S. Cl. 204/38 R; 204/38 B;

204/192 D; 427/74; 427/85; 427/87; 29/572

[58] Field of Search 204/38 R, 38 B, 192 D; 427/74, 85, 86, 87, 88, 82; 29/572; 357/13, 16, 30

[56] References Cited

U.S. PATENT DOCUMENTS

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G. J. Kominak, J. Electrochem. Soc., Sep. 1975, pp.
1272-1273.

Primary Examiner—John H. Mack

Assistant Examiner—William Leader

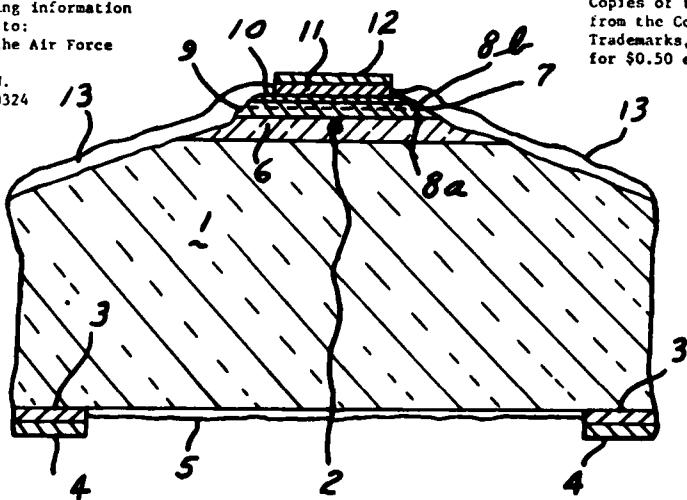
Attorney, Agent, or Firm—Joseph E. Rusz; Casimer K. Salys

[57] ABSTRACT

A narrow-band, inverted homo-heterojunction avalanche photodiode, configured in the shape of a mesa situated upon a substrate which is transparent to selected light energy wavelengths. The diode is inverted for operation such that the incoming light energy enters the substrate side, passes through a wavelength selective buffer layer and is absorbed upon entering the succeeding, active region. Avalanche gain is attained by drift from the area of absorption to the high field p-n homo-heterojunction located immediately thereafter. The device exhibits low levels of noise during operation because absorption is occurring in a low field region and because the ionization and breakdown noise associated with lattice mismatches is avoided through the formation of the p-n homo-heterojunction in one continuous growth process. Appropriate passivation of the mesa walls inhibits surface leakage and breakdown effects.

2 Claims, 18 Drawing Figures

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United States Patent [19]

King

[11] 4,162,222
[45] Jul. 24, 1979

[54] GREASE COMPOSITIONS

[75] Inventor: James P. King, Upper Gwynedd Township, Montgomery County, Pa.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 933,935

[22] Filed: Aug. 15, 1978

[51] Int. Cl.² C10M 1/48; C10M 3/42; C10M 1/44; C10M 3/38

[52] U.S. Cl. 252/32.7 E; 252/32.5; 252/49.6

[58] Field of Search 252/32.5, 32.7 E, 49.6

[56] References Cited

U.S. PATENT DOCUMENTS

3,522,178 7/1970 Peschko et al. 252/32.5

Primary Examiner—Delbert E. Gantz

Assistant Examiner—Irving Vaughn

Attorney, Agent, or Firm—Joseph E. Ruiz; Cedric H.

Kuhn

[57] ABSTRACT

Grease compositions comprising a silicone fluid and a thickening amount of a poly(metal phosphinate) containing at least one XP(R)(H)X group, where X is oxygen or sulfur and R is alkyl or aryl.

6 Claims, No Drawings

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United States Patent [19]

Arnold et al.

[11] **4,162,265**

[45] Jul. 24, 1979

[54] AROMATIC ENYNE COMPOUNDS AND
THEIR SYNTHESIS

[75] Inventors: Fred E. Arnold, Centerville; Bruce A. Reinhardt, New Carlisle; Frederick L. Hedberg, Xenia, all of Ohio

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 946,290

[22] Filed: Sep. 27, 1978

[51] Int. Cl.² C07C 87/52; C07C 49/76;
C07C 39/18

[52] U.S. Cl. 260/578; 260/582;

260/590 D; 528/171; 568/729

[58] Field of Search 260/578, 590 D;
568/729

[56] References Cited

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Shell Int., "French Patent Abstracts", vol. 6c13, 4:2 (1966).

Wesely et al., "Chem. Ab.", vol. 54, ab. 2229-2230 (1960).

Primary Examiner—Winston A. Douglas

Assistant Examiner—John Doll

Attorney, Agent, or Firm—Joseph E. Rusz; Cedric H. Kuhn

[57] ABSTRACT

Difunctional aromatic enyne compounds are prepared by the catalytic coupling of substituted monoethynyl compounds. The compounds are useful as monomers in polycondensation reactions for the preparation of high molecular weight, thermally stable thermoplastic polymers. On thermal treatment of the polymers, the cayne groups along the polymer backbones react by inter-chain reactions to provide the solvent and craze resistance required for application as structural materials.

4 Claims, No Drawings

Requests for licensing information should be addressed to:
U.S. Department of the Air Force AF/JACP 1900 Half Street S.W.
Washington, D.C. 20324

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JAT 00113



PATENT
ABSTRACT

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United States Patent [19]

Speeds et al.

4,162,292

Jul. 24, 1979

[54] **HIGH PRESSURE HYDRAZINE GAS GENERATOR**

[75] Inventors: John A. Speeds, San Jose, Costa Rica; Robert D. Marcy, Chatsworth, Calif.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 844,082

[22] Filed: Oct. 20, 1977

[51] Int. Cl.² B01J 7/02; F02C 3/24;
F02K 7/08

[52] U.S. Cl. 422/206; 60/39.46 M;
422/49; 422/211; 422/236

[58] Field of Search 23/281, 282; 60/257,
60/258, 259, 260, 39.46 M; 422/236, 211, 206,

49
3,298,182 1/1967 Webb 23/281 X
3,303,651 2/1967 Grant et al. 60/257 X
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3,740,198 6/1973 Sandlin et al. 23/281
3,871,828 3/1975 Ellion et al. 23/281
4,069,664 1/1978 Ellion et al. 60/258

Primary Examiner—Barry S. Richman
Attorney, Agent, or Firm—Joseph E. Rusz; Jacob N. Erlich

[57] **ABSTRACT**

A high pressure hydrazine gas generator having a decomposition chamber which contains therein an initiator of I₂O₅ crystals and a plurality of heat retaining balls. The liquid hydrazine which is initially introduced into the decomposition chamber, ignites upon contact with the initiator and creates a high temperature within the decomposition chamber. This high temperature is maintained within the chamber by the heat retaining balls and therefore sustains decomposition of the liquid hydrazine into gases which are emitted from the generator under extremely high pressure.

[56] **References Cited**

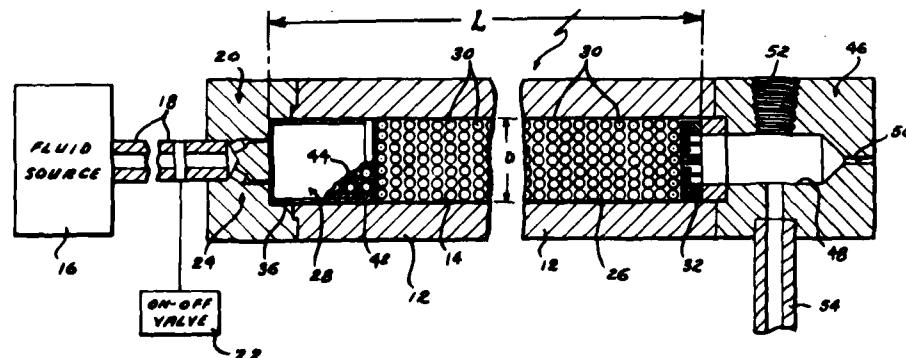
U.S. PATENT DOCUMENTS

3,101,589 8/1963 Hamrick et al. 23/281 X
3,135,703 6/1964 Sill 23/282 X

9 Claims, 2 Drawing Figures

Requests for licensing information should be addressed to:
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United States Patent [19]

Sibley et al.

[11] 4,162,776
[45] Jul. 31, 1979

[54] AERIAL PHOTOGRAPHY CAMERA MOUNT
ASSEMBLY FOR A HELICOPTER

[76] Inventors: Clarence E. Sibley, HQ26TRW, Box
1331, APO New York, N.Y. 09860;
Francisco C. Sablan, 13 Woodland
Dr., Mary Esther, Fla. 32569

[21] Appl. No.: 877,936

[22] Filed: Feb. 18, 1978

[51] Int. Cl.² B64D 47/08

[52] U.S. Cl. 244/118 R; 354/74

[58] Field of Search 244/129.1, 129.5, 118 R,
244/137 R, 1 R, 136; 354/65, 74, 81, 113, 293,
294, 70, 89/37.5 R, 37.5 A, 37.5 D, 37.5 E; 33/1
A; 248/178, 187, 23, 346; 95/12.5

[56] References Cited

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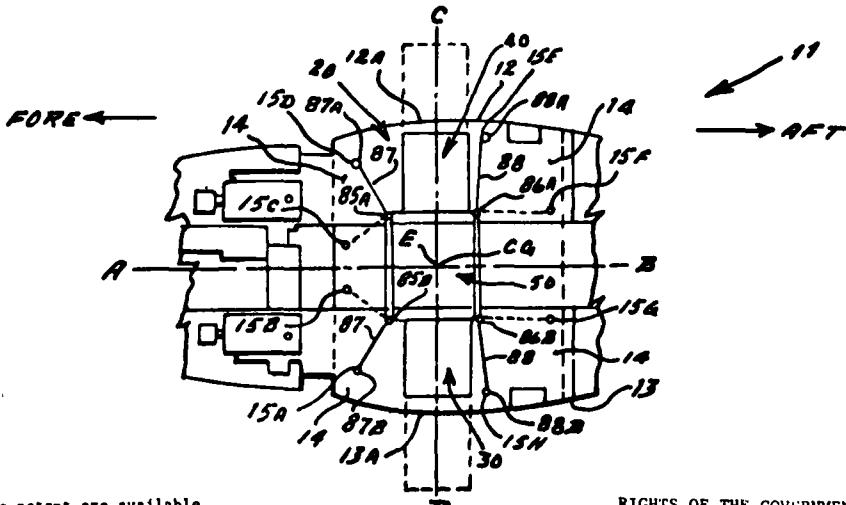
Primary Examiner—Galen L. Barefoot

Attorney, Agent, or Firm—Joseph E. Rusz; Arsea
Tashjian

[57] ABSTRACT

An assembly for mounting, supporting, and releasably holding an angularly adjustable aerial photography camera that is to be used to take aerial reconnaissance photographs, while the assembly is detachably connected to the internal surface of a helicopter that is in stable flight and has an opening in each side. The assembly includes: a rectangular frame which carries the camera; another rectangular frame which carries ballast (i.e., a counterweight); and, a main frame to which the rectangular frames are releasably connected, and in which the frames are slidably movable in opposite directions simultaneously. In flight, the rectangular frames are simultaneously extended on each side of the center of gravity, and of the longitudinal centerline, of the helicopter, and through the opposite openings in the helicopter, with the camera extending out of one of the openings, and with the counterweight extending out of the other opening. This symmetrical loading, and the resultant continued stability of the helicopter in flight, permit the taking of the aerial photographs with the camera.

8 Claims, 17 Drawing Figures



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United States Patent [19]

Gilbert, III et al.

[11] 4,162,777
[45] Jul. 31, 1979

- [54] CANTED SPAR WITH INTERMEDIATE
INTERCOSTAL STIFFENERS
[75] Inventors: William W. Gilbert, III; Eduardo W.
Gomez, both of Fort Worth, Tex.
[73] Assignee: The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.
[21] Appl. No.: 902,131
[22] Filed: May 2, 1978
[51] Int. Cl.² B64C 3/22
[52] U.S. Cl. 244/123; 52/84;
416/226
[58] Field of Search 244/123, 124; 52/84;
428/119, 120; 416/226, 229 R, 233
[56] References Cited
U.S. PATENT DOCUMENTS
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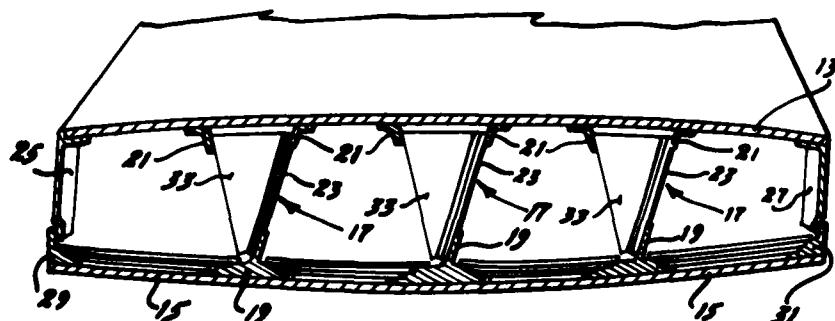
Primary Examiner—Barry L. Kelmachter
Attorney, Agent, or Firm—Joseph E. Rusz; Arsen
Tashjian

[57] ABSTRACT

An aircraft wing box construction including canted sheet metal spar webs continuously tied to the upper and lower skins. Sheet metal intercostal stiffeners of substantially triangular configuration are spaced spanwise along the web to provide shear stiffening for the web and intermittent stabilization for the upper skin. Both the shear web and intercostal stiffeners are fastened to spanwise continuous spar caps which are attached to the upper and lower skins. These caps, supported by the intercostals and webs, provide sufficient stabilization to prevent upper skin buckling up to ultimate design stress with a minimum of shear webs thereby providing significant weight savings.

3 Claims, 5 Drawing Figures

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United States Patent [19]

Martin

[11] 4,162,818
[45] Jul. 31, 1979

[54] INTERCONNECTION FOR PLANAR ELECTRONIC CIRCUITS

[75] Inventor: Jacob H. Martin, Wellesley, Mass.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 865,268

[22] Filed: Dec. 28, 1977

[51] Int. Cl.² H01R 13/00

[52] U.S. Cl. 339/112 R; 339/17 R.

[58] Field of Search 339/112 R, 113 B, 17 M,

339/17 R, 17 CF

[56] References Cited
U.S. PATENT DOCUMENTS

4,045,105 8/1977 Lee et al. 339/17 CF

Primary Examiner—Roy Lake

Assistant Examiner—DeWalden W. Jones

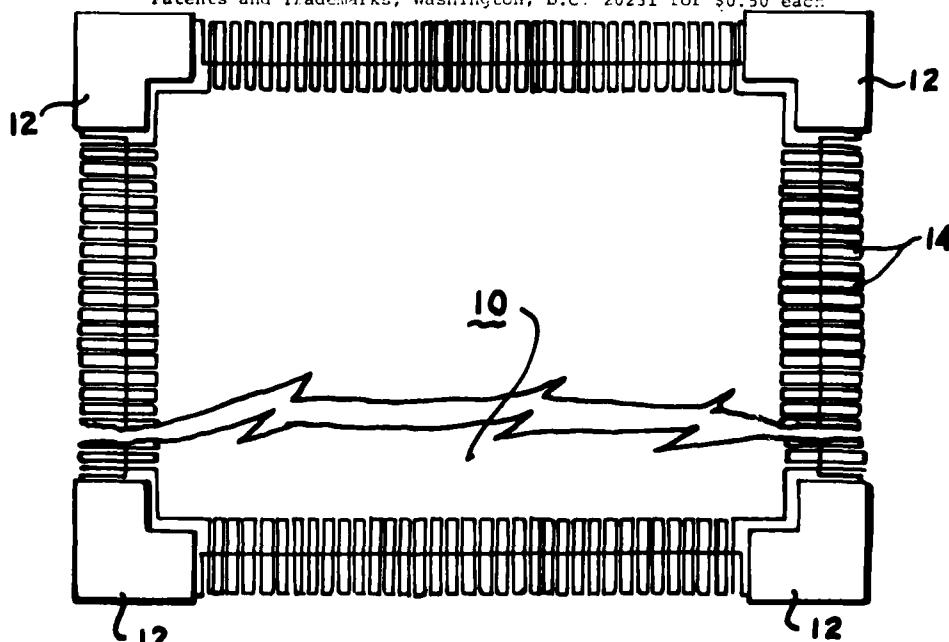
Attorney, Agent, or Firm—Joseph E. Rusz; Henry S. Miller

[57] ABSTRACT

A circuit board with connectors along more than one side designed to be stacked with similar boards, having a plurality of electrical contacts to connect to a connector header with resilient contacts, applying a force to the circuit board which is inclined from a central axis whereby the circuit board and the connector header join in a tight, reliable compression contact.

6 Claims, 3 Drawing Figures

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United States Patent [19]

[11] 4,163,629

McDonough et al.

[45] Aug. 7, 1979

[54] TURBINE VANE CONSTRUCTION

[56]

References Cited

U.S. PATENT DOCUMENTS

[75] Inventors: Edward C. McDonough,
Lawrenceburg, Ind.; Eugene N.
Taley, Hamilton, Ohio

2,807,433	9/1957	Halford et al.	415/137
3,075,744	1/1963	Peterson	415/137
3,240,468	3/1966	Watts et al.	415/115
3,558,237	1/1971	Wall	415/115

[73] Assignee: The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.

Primary Examiner—Louis J. Casaregola
Attorney, Agent, or Firm—Joseph E. Rusz; Richard J.
Killoren

[21] Appl. No.: 864,049

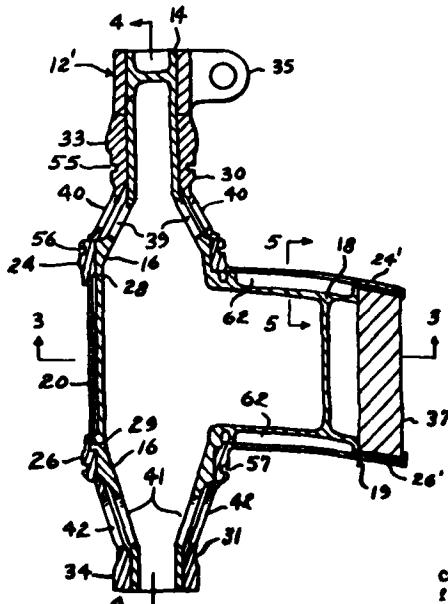
[57] ABSTRACT

[22] Filed: Dec. 23, 1977

A variable area turbine vane, for use in high temperature aircraft gas turbines, having a load carrying spar with a heat shield member surrounding the load carrying member. The heat shield member is positioned in grooves which permit spanwise and chordwise expansion of the heat shield member. Cooling air enters the hollow load bearing member and passes through holes in the load bearing member and heat shield member.

[51] Int. Cl. F01D 25/12; F02C 7/18
[52] U.S. Cl. 415/115; 415/137
[58] Field of Search 415/115, 116, 117, 136,
415/137, 160; 416/96 A, 97 A

2 Claims, 6 Drawing Figures



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United States Patent [19]

Jacobson, Jr.

[11] 4,163,973
[45] Aug. 7, 1979

[54] MEANS FOR DEVELOPING A RADAR
TRACKING ERROR SIGNAL

[75] Inventor: Robert E. Jacobson, Jr., Los
Angeles, Calif.

[73] Assignee: The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.

[21] Appl. No.: 549,402

[22] Filed: Feb. 18, 1975

[51] Int. Cl.²

GO1S 9/22

[52] U.S. Cl.

343/16 M

[58] Field of Search

343/16 M

[56] References Cited

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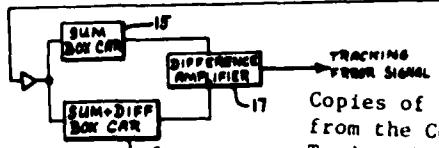
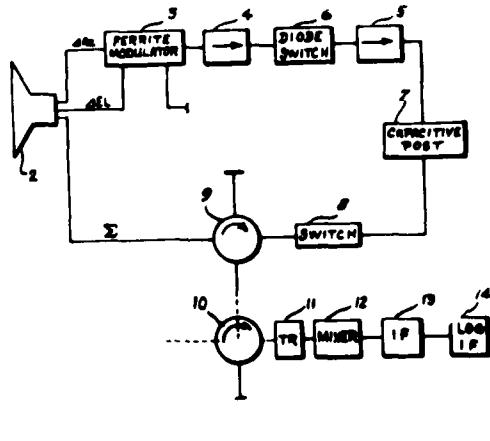
3,229,287 1/1966 Hovda 343/16 M
3,579,239 5/1971 Purcell et al. 343/16 M

Primary Examiner—T. H. Tubbesing
Attorney, Agent, or Firm—Joseph E. Rusz; Willard R.
Matthews, Jr.

[57] ABSTRACT

A tracking radar error signal that is independent of pulse to pulse variations of amplitude of the received signal is derived by combining separately detected sum signal energy and difference signal energy in a manner that provides composite error signal pulses that are one-half sum signal energy and one-half sum plus difference signal energy. The pulse composition is realized by means of an RF switch that interrupts the difference signal during approximately one-half of each pulse period. The composite error signal is detected by an IF logarithmic detector and subsequently processed by two parallel box car generators. One box car generator is gated to process sum signal energy and the other is gated to process sum plus difference signal energy. The tracking error signal is obtained from a single pulse by feeding the outputs of the two box car generators to a differential amplifier and obtaining the difference voltage at its output.

1 Claim, 1 Drawing Figure



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JAT 00119



**PATENT
ABSTRACT**

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United States Patent [19]

[11] 4,163,985

Schuermeyer et al.

Aug. 7, 1979

- [54] **NONVOLATILE PUNCH THROUGH
MEMORY CELL WITH BURIED N+
REGION IN CHANNEL**

[75] **Inventors:** Fritz L. Schuermeyer, Yellow Springs; Charles R. Young, Xenia, both of Ohio

[73] **Assignee:** The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] **Appl. No.:** 838,437

[22] **Filed:** Sep. 30, 1977

[51] **Int. Cl.:** H01L 29/78

[52] **U.S. Cl.:** 357/23; 357/13;
357/54; 357/59; 307/238; 365/184

[58] **Field of Search:** 365/184; 357/23, 54,
357/13, 59; 307/238

[56] **References Cited**
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3,923,559	12/1975	Sinha	357/54

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W. Johnson, "Multiple Masking Technique in Ion Implantation," IBM Tech. Discl. Bull., vol. 15 #2, Jul. 1972, pp. 660-661.

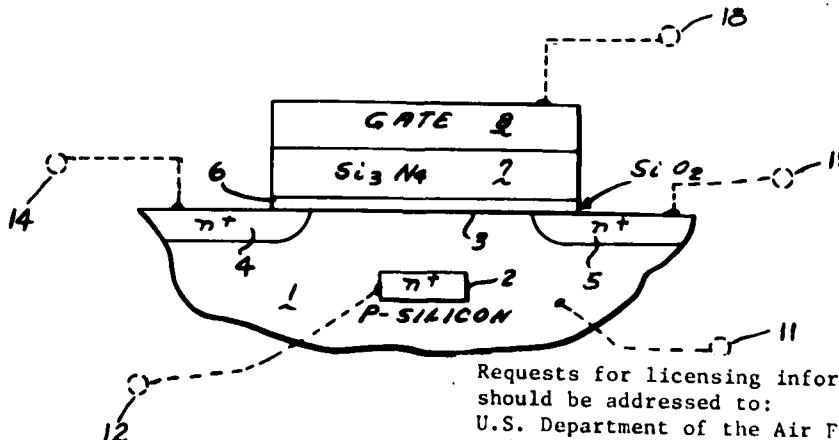
Primary Examiner—Joseph E. Clawson, Jr.
Attorney, Agent, or Firm—Joseph E. Rusz; Robert Kern
Duncan

ABSTRACT

A nonvolatile memory cell is disclosed that has a buried n+ layer from which charge (electrons) is injected into the insulator of n-channel MNOS (Metal Nitride Oxide Semiconductor) type devices.

3 Claims, 6 Drawing Figures

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PATENT
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United States Patent [19]

Schmidt

[11] 4,164,741
[45] Aug. 14, 1979

[54] DECEPTION CIRCUITRY FOR AUTOMATIC
RANGE GATE TRACKING IN FIRE
CONTROL RADAR

[75] Inventor: Jerry D. Schmidt, Enon, Ohio

[73] Assignee: The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.

[21] Appl. No.: 761,891

[22] Filed: Sep. 13, 1968

[51] Int. Cl.² G01S 7/38

[52] U.S. Cl. 343/18 E

[58] Field of Search 343/18 E; 328/58

[56] References Cited

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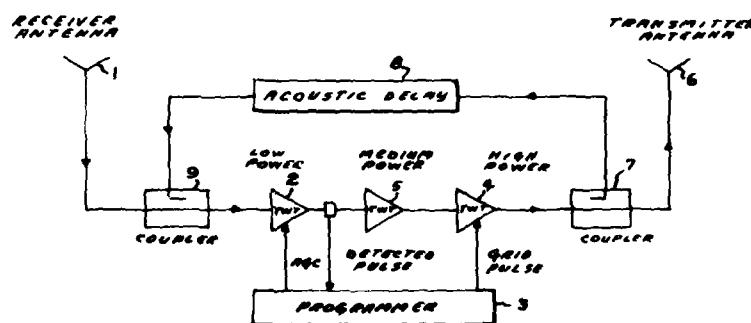
Primary Examiner—T. H. Tubbesing
Attorney, Agent, or Firm—Joseph E. Rusz; Robert Kern
Duncan

[57] ABSTRACT

An acoustic delay line is used in a feed-back loop in the traveling wave tube repeater chain of an electronic countermeasures system to provide a wider transmitted pulse (than the pulse received by the ECM system) resulting in range gate deception in an opposing tracking radar.

4 Claims, 3 Drawing Figures

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JAT 00121

R&D RECORD (Patent Abstract)

AFSC - Andrew AFSC Mod 1978



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United States Patent [19]

Paciorek et al.

[11] **4,166,071**
[45] Aug. 28, 1979

[54] MONOPHOSPHA-S-TRIAZINES

[75] Inventors: Kazimiera L. Paciorek, Corona del Mar; Reinbold H. Kratz; Jacqueline Kaufman, both of Costa Mesa; Thomas I. Ito, Fountain Valley, all of Calif.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 865,271

[22] Filed: Dec. 28, 1977

[51] Int. Cl.² C10M 1/44; C07F 9/22;
C07F 9/65

[52] U.S. Cl. 260/551 P; 252/49.9;
252/400 A

[58] Field of Search 260/551 P, 543 P

[56] References Cited

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Kukhar et al., CA 82:4216r, (1975).

Primary Examiner—Thomas Waltz
Attorney, Agent, or Firm—Joseph E. Rusz; William J. O'Brien

[57] **ABSTRACT**

A method for synthesizing monophospha-s-triazines by effecting a reaction between an amidoylamidine and a trihalo-phosphorane.

5 Claims, No Drawings

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United States Patent [19]

Leavitt

[11] 4,166,416

[45] Sep. 4, 1979

[54] OBSTURATING SPLIT DISC

[75] Inventor: Leland F. Leavitt, Ogden, Utah

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No. 900,949

[22] Filed: Apr. 28, 1978

[51] Int. Cl. 2 F42B 25/30

[52] U.S. Cl. 102/2

[58] Field of Search 102/2-4, 102/223, 225, 263, 1 R

[56] References Cited

U.S. PATENT DOCUMENTS

2,364,197 12/1944 Dec 102/2

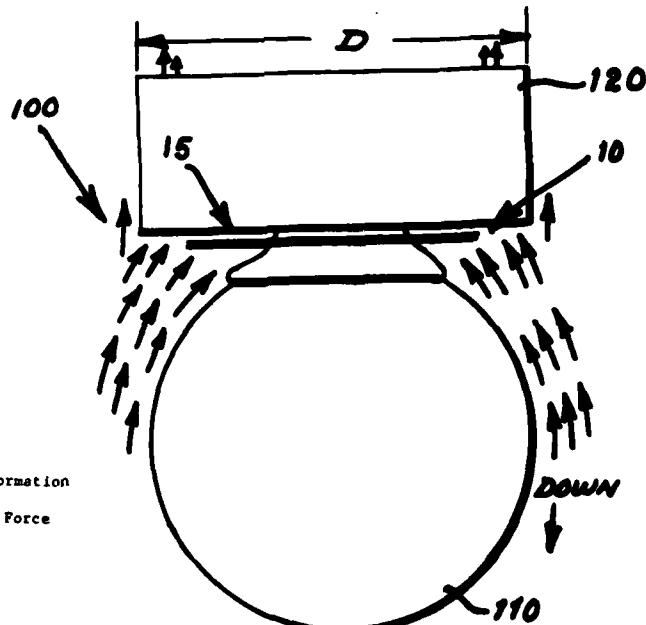
Primary Examiner—Charles T. Jordan
Attorney, Agent, or Firm—Joseph E. Ruiz; Arsen
Taahjian

[57] ABSTRACT

A structural improvement to, and a method of improving, an air-dropped spin-actuated bomb of the anti-personnel type. The structural improvement comprises a split flexible polyethylene obturating disc which replaces the prior art rigid metal obturating disc used on these bombs. The improved disc is releasably connected to the bomb, whereas the prior art disc is fixedly attached to the bomb. The method comprises the step of disposing and releasably connecting the split flexible polyethylene obturating disc to the bomb at a location between the forward body section of the bomb and the aft fin section thereof. The result of the use of the structural improvement, and of the improvement method, is that the arming of the bomb is delayed, so that the bomb, which could only be safely air-dropped from a low speed aircraft, now can also be air-dropped from a high speed, or a very high speed, aircraft.

4 Claims, 3 Drawing Figures

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PATENT
ABSTRACT

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United States Patent [19]

McGraw

[11] 4,166,445
[45] Sep. 4, 1979

[54] **LOW COST SOLAR COLLECTOR**

[76] Inventor: Thomas F. McGraw, 7538 Axton St.,
Springfield, Va. 22151

[21] Appl. No.: 866,188

[22] Filed: Dec. 30, 1977

[51] Int. CL² F24J 3/02

[52] U.S. Cl. 126/432; 126/449

[58] Field of Search 126/270, 271; 237/1 A;
165/104, 107

[56] References Cited

U.S. PATENT DOCUMENTS

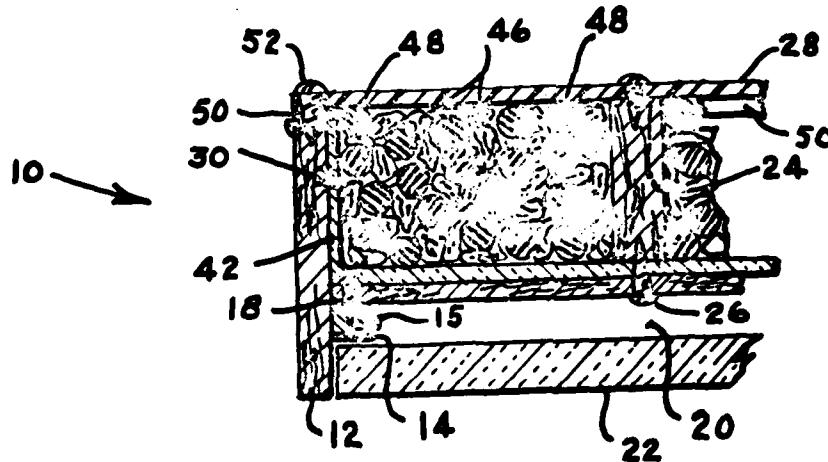
3,908,632	9/1975	Poulsen	.....	126/271
3,939,818	2/1976	Hamilton et al.	.....	126/271
3,981,294	9/1976	Deminet et al.	.....	126/271
4,067,316	1/1978	Brin et al.	.....	126/271
4,082,082	4/1978	Harvey	.....	126/271
4,112,921	9/1978	MacCracken	.....	126/271

Primary Examiner—James C. Yeung
Attorney, Agent, or Firm—Joseph E. Rusz; Jacob N.
Erlich

[57] ABSTRACT

A solar collector having a frame-like wooden housing which contains therein heat absorbing material in the form of pellets of coal or "diced" automobile tires. This material is sealed within the housing by a transparent cover. The resultant sealed container allows a flow of working fluid to pass therethrough by way of a pair of perforated pipes. The collector is oriented to receive maximum solar radiation in order to heat the heat absorbing material. The working fluid which flows in contact with the heat absorbing material, absorbs heat therefrom, and, by means of a circulating system which is not part of the invention is generally carried to a storage tank or the like for use at a later time.

10 Claims, 4 Drawing Figures



RIGHTS OF THE GOVERNMENT

The invention described herein may be manufactured and used by or for the Government of the United States for all government purposes without the payment of any royalty.

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JAT 00124



PATENT
ABSTRACT

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United States Patent [19]

Seifert et al.

[11] 4,166,597
[45] Sep. 4, 1979

[54] STOWABLE AND INFLATABLE VEHICLE

[75] Inventors: Clair F. Seifert, Newport Beach; Harvey S. Seepy, Manhattan Beach; Thorvald K. Petersen, Santa Monica, all of Calif.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 468,702

[22] Filed: May 9, 1974

[51] Int. Cl.² B64G 1/00
[52] U.S. Cl. 244/160; 244/158;

244/163

[58] Field of Search 244/158, 159, 160, 163

[56] References Cited

U.S. PATENT DOCUMENTS

3,220,004 11/1965 Gillespie, Jr. 244/158
3,405,886 10/1968 Gosnell et al. 244/158

Primary Examiner—Charles T. Jordan

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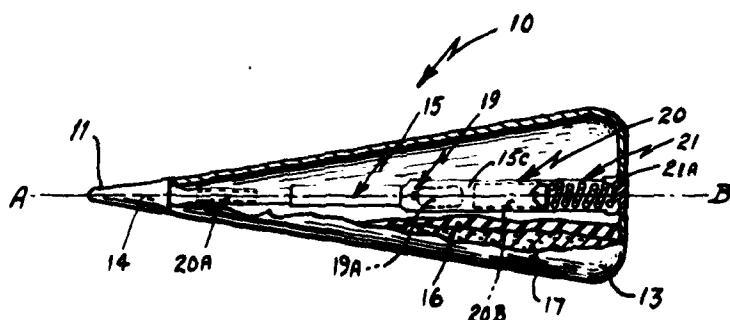
Attorney, Agent, or Firm—Joseph E. Rusz; Arsen Tashjian

[57] ABSTRACT

A stowable and inflatable vehicle, adapted for use as a decoy space vehicle and as a replica of a relatively hot parent space vehicle. In addition to other components, the inventive decoy and replica vehicle includes: a telescoping central tubular member that provides a rigid support and means for telescoping which aids in stowing the replica inventive vehicle; an inflatable structure which forms an external shape; and, a heater blanket in the outer layers of the structure to simulate the surface temperature of the parent vehicle. As a matter of preference, and in this adaptation, the inventive replica space vehicle is of a conical external configuration. The capability of this inventive vehicle to be inflated to the desired external shape, rather than to assume the external shape by use of solely mechanical expanding means, provides superior structural integrity, and also permits a significant reduction in external dimensions and easy storage, even where stiff materials (which are difficult to fold and to unfold) must be, or preferably are, used.

7 Claims, 3 Drawing Figures

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United States Patent [19]

Seifert et al.

[11] 4,166,598

[45] Sep. 4, 1979

[54] VEHICLE ENSHROUDING APPARATUS

[75] Inventors: Clair F. Seifert, Newport Beach; Harvey S. Seapy, Manhattan Beach; David E. Dunlap, Mission Viejo, all of Calif.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No. 474,479

[22] Filed: May 30, 1974

[51] Int. Cl. 2 B64G 1/00

[52] U.S. Cl. 244/160; 244/158;

244/163

[58] Field of Search 244/158-160,
244/163; 102/105

[56] References Cited

U.S. PATENT DOCUMENTS

3,220,004 11/1965 Gillespie, Jr. 244/158
3,405,886 10/1968 Gosnell et al. 244/158

Primary Examiner—Charles T. Jordan

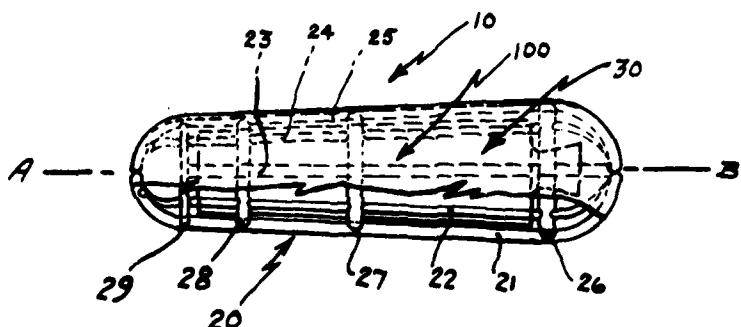
Attorney, Agent, or Firm—Joseph E. Rusz; Arsen Tashjian

ABSTRACT

Stowable and inflatable apparatus for enshrouding a vehicle. The apparatus, in its most generic and most basic embodiment, includes an inflatable framework external of which is attached a multilayer superinsulating blanket shroud. The inflatable tubular framework includes a plurality of inflatable tubular-shaped longitudinal members in spaced-apart relationship, and a plurality of inflatable toroidal-shaped members also in spaced-apart relationship. Each of the toroidal-shaped members is positioned essentially perpendicular to, and in contact with, each of the tubular-shaped longitudinal members. The inventive apparatus solves the problems which are inherent in enclosing a large, relatively hot space vehicle to retain the heat therefrom, and in folding (and stowing) and in unfolding an apparatus in a space environment.

5 Claims, 2 Drawing Figures

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JAT UU126



PATENT
ABSTRACT

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United States Patent [19]

Witucki et al.

[11] 4,168,273
[45] Sep. 18, 1979

[54] METHOD FOR THE PREPARATION OF
GLYCIDYL
2,2-DINITRO-2-FLUOROETHOXIDE

[75] Inventors: Edward F. Witucki, Van Nuys;
Milton B. Frankel, Tarzana, both of
Calif.

[73] Assignee: The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.

[21] Appl. No.: 452,228

[22] Filed: Mar. 14, 1974

[51] Int. Cl. C07D 301/28
[52] U.S. Cl. 260/348.14; 149/19.3;
149/88; 260/348.45

[58] Field of Search 149/88; 260/348 R, 348.14,
260/348.45

[56]

References Cited

U.S. PATENT DOCUMENTS

3,636,060	1/1972	Frankel et al.	260/348.14
3,652,600	3/1972	Grakauskas	260/348 R
3,784,420	1/1974	Frankel et al.	149/88 X

Primary Examiner—Leland A. Sebastian
Attorney, Agent, or Firm—Joseph E. Rusz; William J.
O'Brien

[57]

ABSTRACT

A method for synthesizing glycidyl 2,2-dinitro-2-2
fluoroethoxide which comprises adding sodium hy-
droxide to a reaction mixture of epibromohydrin and
2,2-dinitro-2-fluoroethanol in the presence of carbon
tetrachloride as a solvent for the reaction mixture.

1 Claim, No Drawings

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JAT 00127



PATENT
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United States Patent [19]

Covitt

[11] 4,168,470
[45] Sep. 18, 1979

[54] TWO-BIT A/D CONVERSION APPARATUS
WITHOUT A SIGNAL DERIVED
AUTOMATIC GAIN CONTROL

3,611,350 10/1971 Leibowitz et al. 340/347 AD
3,735,391 5/1973 Games et al. 340/347 SY
3,983,499 9/1976 Tan 331/12 X
4,013,965 5/1977 Scharfe 325/320
4,062,005 12/1977 Freed et al. 340/177 R X

[75] Inventor: Arthur L. Covitt, Sudbury, Mass.

[73] Assignee: The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.

[21] Appl. No.: 768,812

[22] Filed: Feb. 15, 1977

[51] Int. Cl.² H03D 3/00; H03K 13/02;
H04B 1/06

[52] U.S. Cl. 325/344; 329/112;
340/347 AD; 340/347 M

[58] Field of Search 340/347 M, 347 SY, 347 AD;
329/131, 112, 124; 328/171, 173; 325/414, 400,
344-349; 331/12

[56] References Cited

U.S. PATENT DOCUMENTS

3,181,156 4/1965 Ward 325/349 X

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Landee, et al., Electronic Designers' Handbook,

McGraw-Hill Book Co., 1957, pp. 5-37 to 5-39.

The Engineering Staff of Analog Devices, Inc.,
Analog-Digital Conversion Handbook, 6/1972, pp.
1-26 to 1-31.

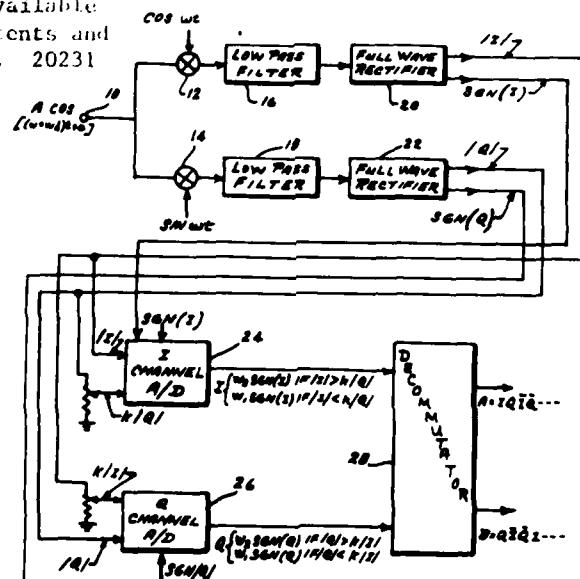
Primary Examiner—Thomas J. Slovan
Attorney, Agent, or Firm—Joseph E. Rusz; William
Stepanishen

[57] ABSTRACT

A two-bit analog to digital conversion apparatus for
direct and instantaneous generation of digital signals
which are independent of the absolute amplitude of the
input signal envelope.

5 Claims, 1 Drawing Figure

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United States Patent [19]

Black, Jr.

[11] **4,168,473**

[45] **Sep. 18, 1979**

[54] INTERNAL ARRESTER BEAM CLIPPER

[75] Inventor: Maurice D. Black, Jr., Simi Valley, Calif.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 852,771

[22] Filed: Nov. 18, 1977

[51] Int. Cl.² H01S 3/08

[52] U.S. Cl. 331/94.5 C; 331/94.5 D

[58] Field of Search 331/94.5 C, 94.5 D, 331/94.5 T

[56] References Cited

U.S. PATENT DOCUMENTS

3,426,293	2/1969	Snitzer	331/94.5 C
3,573,656	4/1971	Marcatili	331/94.5 C
3,699,471	10/1972	Mulready et al.	331/94.5 D
3,980,397	9/1976	Judd et al.	331/94.5 T

Primary Examiner—William L. Sikes

Attorney, Agent, or Firm—Joseph E. Rusz; Jacob N. Erlich

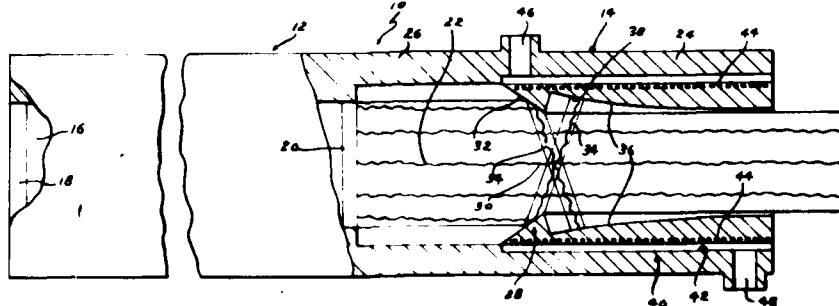
[57] ABSTRACT

An internal arresting beam clipper having a cylindrically shaped housing of predetermined length and a clipping mirror located at one end thereof. The clipping mirror is optically aligned with an out-of-round beam as well as being positioned at a preselected angle with respect to the longitudinal axis of the housing. The beam clipper removes the out-of-round portion of the beam by reflecting that portion of the beam against the wall of the housing. The housing acts as a heat sink and absorbs the rejected radiation that has been reflected thereto by the clipping mirror with the bulk of the beam being passed through the clipping mirror and onto a target.

10 Claims, 3 Drawing Figures

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United States Patent [19]

Brassaw

[11] 4,168,500
[45] Sep. 18, 1979

[54] **METHOD AND SYSTEM FOR MOVING TARGET ELIMINATION AND INDICATION USING SMOOTHING FILTERS**

[75] Inventor: Lloyd L. Brassaw, Canoga Park, Calif.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 233,836

[22] Filed: Mar. 10, 1972

[51] Int. Cl.: G01S 9/22; G01S 9/42

[52] U.S. Cl.: 343/7.7; 343/5 CM;
343/7 A; 343/16 M

[58] Field of Search: 343/7.7, 16 M, 5 CM,
343/7 A

[56] References Cited

U.S. PATENT DOCUMENTS

3,308,457	3/1967	Winn	343/16 M X
3,378,843	4/1968	Sherman	343/16 M
3,480,953	11/1969	Shreve	143/7.7

3,706,989 12/1972 Taylor, Jr. 343/7 A

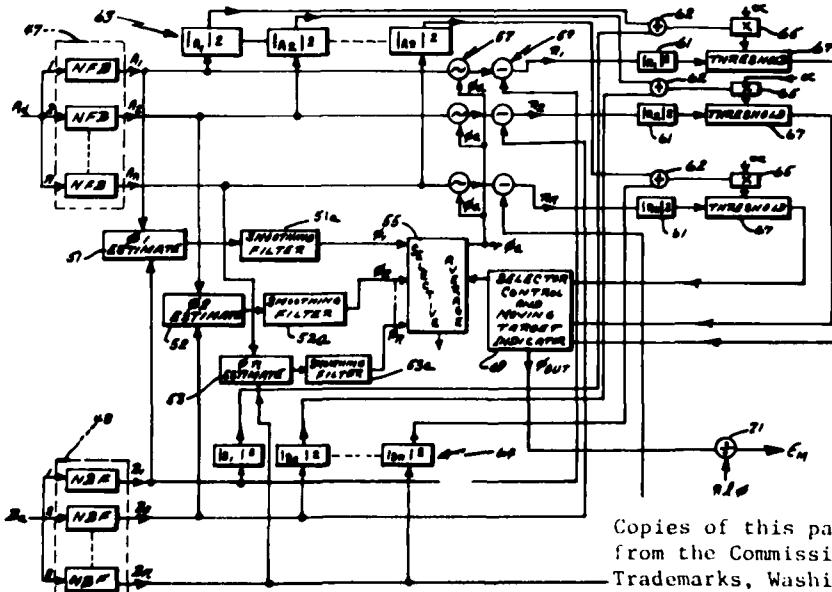
Primary Examiner—Malcolm F. Hubler
Attorney, Agent, or Firm—Joseph E. Rusz; Julian L. Siegel

[57] ABSTRACT

In-phase sum and difference signals and quadrature sum and difference signals from a monopulse radar system are processed to form the sum of the in-phase signals, the sum of the quadrature signals, the difference of the in-phase signals, and the difference of the quadrature signals. The processed sum signals and the processed difference signals are then combined to form complex signals one of which is advanced and the other retarded by predetermined time. The complex signals are then divided into sequences of frequencies of identical banks of narrow band filters. The differences between the outputs of corresponding filters from each bank are smoothed by low pass filters, averaged and then divided by a constant to form a beam pointing error value.

6 Claims. 3 Drawing Figures

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ABSTRACT

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United States Patent [19]

Brassaw

[11] 4,168,501

[45] Sep. 18, 1979

[54] METHOD AND SYSTEM FOR MOVING TARGET ELIMINATION AND INDICATION

3,706,989 12/1972 Taylor, Jr. 343/7 A

[75] Inventor: Lloyd L. Brassaw, Canoga Park, Calif.

Primary Examiner—Malcolm F. Hubler
Attorney, Agent, or Firm—Joseph E. Rusz, Julian L. Siegel

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[57] ABSTRACT

[21] Appl. No.: 233,835

In-phase sum and difference signals and quadrature sum and difference signals from a monopulse radar system are processed to form the sum of the in-phase signals, the sum of the quadrature signals, the difference of the in-phase signals, and the difference of the quadrature signals. The processed sum signals and the processed difference signals are then combined to form complex signals one of which is advanced and the other retarded by predetermined time. The complex signals are then divided into sequences of frequencies by identical banks of narrow band filters. The differences between the outputs of corresponding filters from each bank are averaged and then divided by a constant to form a beam pointing error value.

[22] Filed: Mar. 10, 1972

4 Claims, 3 Drawing Figures

[51] Int. Cl. 2 G01S 9/22; G01S 9/42

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Washington, D.C. 20324

[52] U.S. Cl. 343/7.7; 343/5 CM;

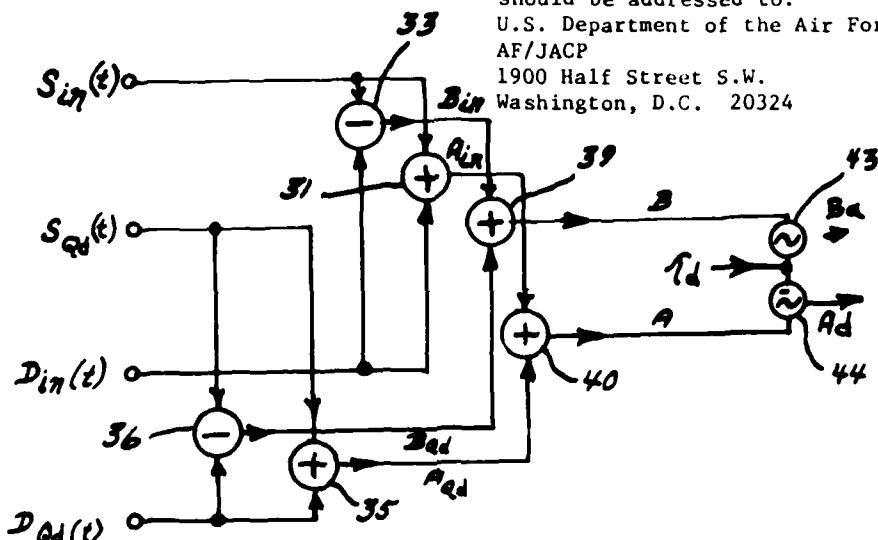
343/7 A; 343/16 M

[58] Field of Search 343/7.7, 16 M, 5 CM,
343/7 A

[56] References Cited

U.S. PATENT DOCUMENTS

3,308,457 3/1967 Winn 343/16 M X
3,378,843 4/1968 Sherman 343/16 M
3,480,953 11/1969 Shreve 343/7.7



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JAT 00131



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United States Patent [19]

Dempsey et al.

[11] **4,168,532**
[45] Sep. 18, 1979

[54] **MULTIMODE DATA DISTRIBUTION AND CONTROL APPARATUS**

[75] Inventors: Gayle C. Dempsey, Needham; Richard P. Witt, Weston, both of Mass.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 771,598

[22] Filed: Feb. 24, 1977

[51] Int. Cl.² G06F 3/04

[52] U.S. Cl. 364/900

[58] Field of Search 179/15 R, 15 BA, 15 BV, 179/15 AL; 364/200 MS File, 900 MS File

Copies of this patent are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231 for \$0.50 each.

[56]

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3,851,104	11/1974	Willard et al.	179/15 BV X
3,898,373	8/1975	Walsh	364/200 X
3,905,025	9/1975	Davis et al.	364/200
4,002,843	1/1977	Rackman	179/15 AL
4,053,950	10/1977	Bourke et al.	364/200

Primary Examiner—Gareth D. Shaw

Assistant Examiner—Thomas M. Heckler

Attorney, Agent, or Firm—Joseph E. Rusz; William Stepanishen

[57] **ABSTRACT**

A multiplex telecommunications system for simultaneously handling digital data, video and voice traffic on a local level using either broadband coaxial cable or optic fibers as a transmission medium.

5 Claims, 5 Drawing Figures

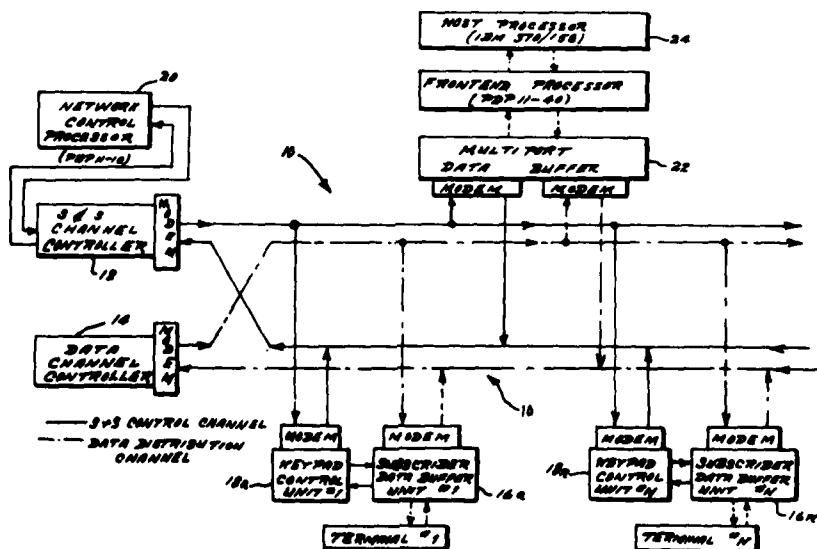
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United States Patent [19]

Cubalchini

[11] **4,168,908**
[45] Sep. 25, 1979

[54] PRECISION POINTING AND TRACKING CONTROL SYSTEM

[75] Inventor: Ronald Cubalchini, Santa Monica, Calif.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 866,189

[22] Filed: Dec. 30, 1977

[51] Int. Cl.² G01B 11/26

[52] U.S. Cl. 356/152; 250/203 R;

356/363

[58] Field of Search 356/141, 152, 356, 358,
356/363; 250/203 R

[56] References Cited

U.S. PATENT DOCUMENTS

4,102,572 7/1978 O'Meara 356/152
4,140,398 2/1979 Hodder 356/152

Primary Examiner—S. C. Buczinski

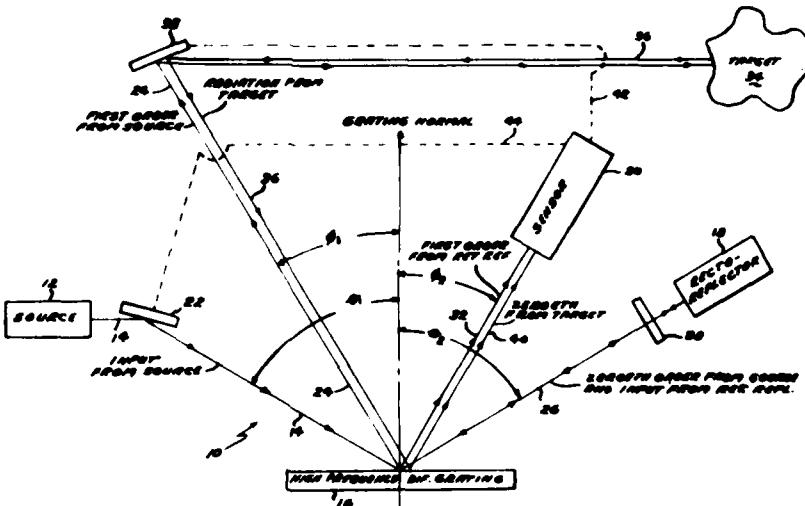
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Attorney, Agent, or Firm—Joseph E. Rusz; Jacob N. Erlich

[57] ABSTRACT

A precision pointing and tracking control system having a source for producing an electromagnetic beam, a high efficiency diffraction grating, a retroreflector, sensor and means for adjusting the optical relationship between the above elements and a target. The diffraction grating diffracts a large portion of an incident narrow spectral band or monochromatic beam into a single (non-zero) diffraction order in conjunction with the retroreflector as a means of (1) sampling the input narrow band or monochromatic beam, and (2) collecting any radiated electromagnetic energy coming from the direction of propagation (i.e., from the target or receiver). By maintaining a proper relationship between target and source radiation, precision pointing and tracking of the target by the beam produced from the source can be easily accomplished.

10 Claims, 1 Drawing Figure



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JAT 00133



PATENT
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United States Patent [19]

Wong et al.

[11] 4,169,267

[45] Sep. 25, 1979

[54] BROADBAND HELICAL ANTENNAS

[75] Inventors: Jimmy L. Y. Wong, Redondo Beach; Howard E. King, Gardena, both of Calif.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 916,685

[22] Filed: Jun. 19, 1978

[51] Int. CL² H01Q 9/00; H01Q 1/36

[52] U.S. Cl. 343/895; 343/749

[58] Field of Search 343/749, 750, 895

[56] References Cited

U.S. PATENT DOCUMENTS

2,966,679	12/1960	Harris	343/895
3,569,979	3/1971	Munk et al.	343/895
3,683,393	8/1972	Selby	343/895
3,940,772	2/1976	Bendov	343/895

Copies of this patent are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231 for \$0.50 each.

OTHER PUBLICATIONS

Angelacos, D. J. et al., "Modifications on the Axial-Mode Helical Antenna," in IEEE Proceedings, Apr. 1967, pp. 558-559.

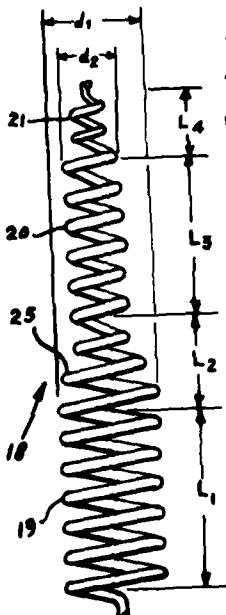
Primary Examiner—Alfred E. Smith
Assistant Examiner—Harry E. Barlow
Attorney, Agent, or Firm—Joseph E. Rusz; Willard R. Matthews

[57] ABSTRACT

Increased bandwidth, reduced axial ratios and improved beam shape and sidelobe characteristics are achieved with non-uniform diameter helical antennas. The antenna structures are configured to various combinations of tapered diameter and uniform sections. By varying the number of turns, diameters of the helix sections and lengths of the various helix sections, antennas are synthesized to yield specific gain-frequency response characteristics.

2 Claims, 8 Drawing Figures

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JAI 00134



PATENT
ABSTRACT

FROM THE AIR FORCE SYSTEMS COMMAND

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United States Patent [19]

Schell et al.

[11] 4,169,268
[45] Sep. 25, 1979

- [54] METALLIC GRATING SPATIAL FILTER
FOR DIRECTIONAL BEAM FORMING
ANTENNA
[75] Inventors: Allan C. Schell, Winchester; Robert
J. Mailoux, Wayland, both of Mass.
[73] Assignee: The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.
[21] Appl. No.: 904,964
[22] Filed: May 11, 1978

- Related U.S. Application Data
[63] Continuation-in-part of Ser. No. 678,516, Apr. 19,
1976, abandoned.
[51] Int. Cl. H01Q 15/10
[52] U.S. Cl. 343/909
[58] Field of Search 343/753, 754, 755, 872,
343/909, 911 R

[56] References Cited
U.S. PATENT DOCUMENTS

- 2,684,725 7/1956 Koch 343/909
2,756,424 7/1956 Lewis et al. 343/909
2,763,840 9/1956 Ortusi et al. 343/753

3,708,796 1/1973 Gilbert 343/909

FOREIGN PATENT DOCUMENTS

- 1058285 3/1954 France 343/754
665747 1/1952 United Kingdom 343/753

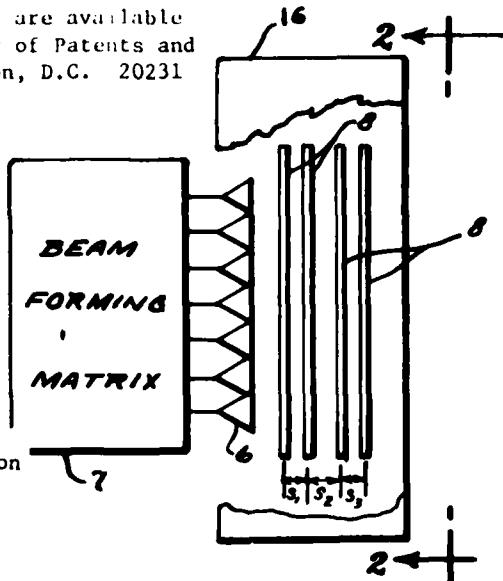
Primary Examiner—Eli Lieberman
Attorney, Agent, or Firm—Joseph E. Rusz; Willard R.
Matthews

[57] ABSTRACT

Sidelobe suppression and other beam transmission property manipulations in directional beam forming antennas is accomplished by means of a spatial filter. The filter geometry consists of a plurality of metallic gratings separated by air or other low dielectric constant dielectric substance. The filter is placed directly over the antenna radiating aperture and is encompassed by a tunnel structure of electromagnetic wave energy absorbing material. The shunt susceptance characteristics of the metallic gratings together with the integrating spacing distances are synthesized in a manner that effects full transmission of beam power in a selected beam direction while offering substantial rejection of it in other directions.

7 Claims, 11 Drawing Figures

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United States Patent [19]

Goebel et al.

[11] 4,170,008
[45] Oct. 2, 1979

[54] CLUTTER DISCRIMINATING FUZE APPARATUS

[56] References Cited

U.S. PATENT DOCUMENTS

[75] Inventors: Robert H. Goebel, Bridgeton; Dale A. Fogle, St. Louis Township, St. Louis County, both of Mo.

3,332,077	7/1967	Nard et al.	343/7 PF
3,821,737	6/1974	Kalmus	343/7 PF
3,858,207	12/1974	Macomber et al.	343/7 PF
3,906,493	9/1975	Adrian et al.	343/7 PF

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Primary Examiner—Malcolm F. Hubler
Attorney, Agent, or Firm—Joseph E. Rusz; William Stepanishen

[21] Appl. No.: 553,360

[57] ABSTRACT

[22] Filed: Feb. 28, 1975

A clutter discriminating fuze apparatus for preventing prefires and duds which may result through the use of electronic countermeasure techniques by the enemy.

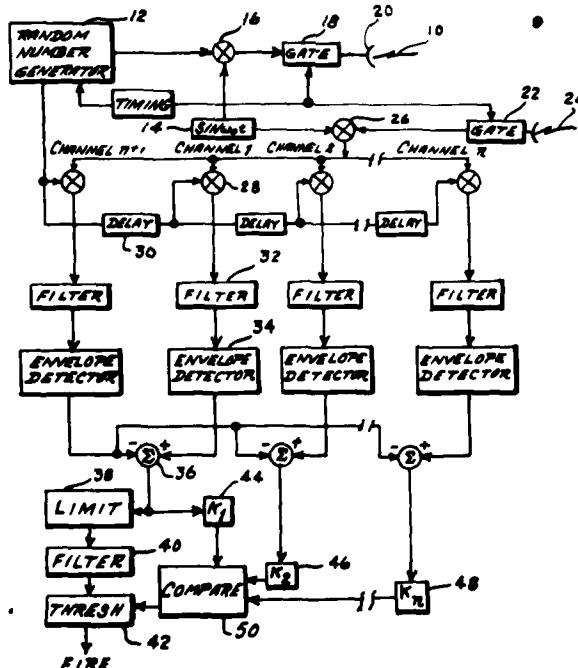
[51] Int. Cl.² F42C 13/04; G01S 9/37

5 Claims, 1 Drawing Figure

[52] U.S. Cl. 343/7 PF; 102/214

[58] Field of Search 343/7 PF; 102/214

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JAT 00136



PATENT
ABSTRACT

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United States Patent [19]

Wilkinson

[11] **4,173,122**

[45] **Nov. 6, 1979**

[54] INTERMITTENT BURNING JET ENGINE

2,745,248 5/1956 Winter et al. 60/247
2,834,183 5/1958 Bertin et al. 60/249
3,533,239 10/1970 Ghousasian 60/247

[75] Inventor: David B. Wilkinson, Xenia, Ohio
[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Primary Examiner—Louis J. Casaregola
Attorney, Agent, or Firm—Joseph E. Rusz; Richard J. Killoren

[21] Appl. No.: 876,442

[57] **ABSTRACT**

[22] Filed: Feb. 9, 1978

An intermittent burning ramjet engine having a rough wall combustor with fuel supplied to a fuel injector upstream of the combustor. The fuel is cyclically ignited at a predetermined frequency. A resonator tuned to a frequency less than one-tenth of the combustor frequency is positioned between the combustor and the ramjet inlet.

[51] Int. Cl.² F02K 7/02

[52] U.S. Cl. 60/247; 60/270 R

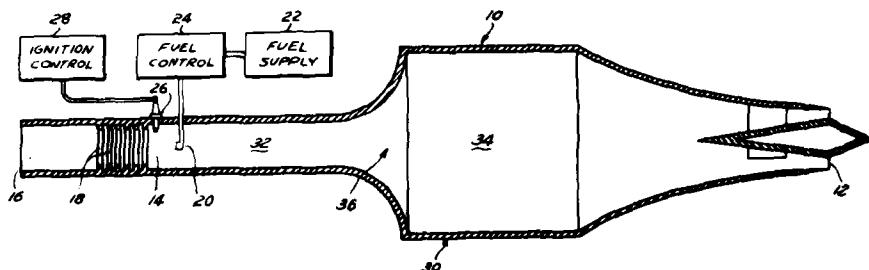
[58] Field of Search 60/39.76, 39.77, 247, 60/248, 249, 270 R

[56] References Cited

U.S. PATENT DOCUMENTS

2,647,365 8/1953 Myers 60/270 R

3 Claims, 1 Drawing Figure



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JAT 00137



PATENT
ABSTRACT

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United States Patent [19]

Macdonald

[11] 4,173,322
[45] Nov. 6, 1979

[54] FLUTTER PREVENTION MEANS FOR
AIRCRAFT PRIMARY FLIGHT CONTROL
SURFACES

[75] Inventor: Kenneth A. B. Macdonald, Maple
Valley, Wash.

[73] Assignee: The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.

[21] Appl. No.: 900,621

[22] Filed: Apr. 27, 1978

[51] Int. Cl.² B64C 13/00

[52] U.S. Cl. 244/75 A; 244/83 A

[58] Field of Search 244/83 A, 75 R, 75 M,
244/78, 90 R, 213, 215

[56] References Cited

U.S. PATENT DOCUMENTS

1,747,344	2/1930	Bell	244/83 A
2,246,203	6/1941	Florez	244/83 A
2,835,459	5/1958	Stewart	244/83 A

FOREIGN PATENT DOCUMENTS

403223 4/1943 Italy 244/83 A

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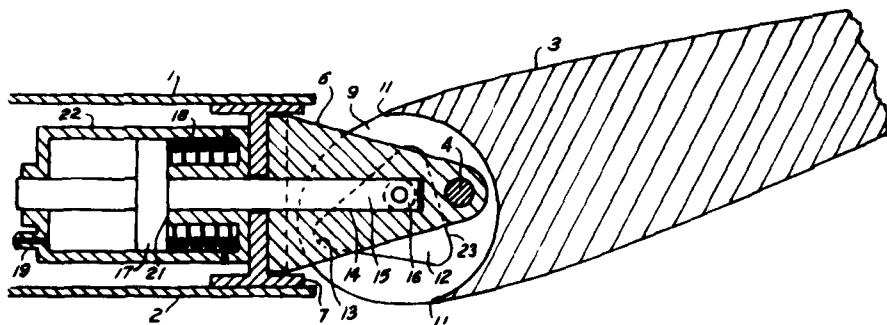
Primary Examiner—Galen L. Barefoot
Attorney, Agent, or Firm—Joseph E. Rusz; James S.
Shannon; Casimer K. Salys

[57] ABSTRACT

An apparatus attached to the flight control surface designed to lock the surface in a fixed and generally neutral position when a hydraulic pressure failure occurs. A spring loaded hydraulic actuator is mounted in the fixed wing structure but has an arm with a locking roller extending into a wedge shaped recess in the adjacent movable control surface. When hydraulic pressure is present the actuator spring is compressed and the locking roller on the actuator arm is moved to the wide end of the wedge, effectively avoiding any contact between the roller and the flight control surface surrounding it irrespective of the control surface orientation. Upon the occurrence of a hydraulic pressure drop, the compressed spring translates the actuator arm drawing the locking roller into a detent in the narrow end of the wedge, thereby inhibiting control surface rotation and flutter.

2 Claims, 3 Drawing Figures

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JAT 00138



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United States Patent [19]

Palmer

[11] 4,175,812
[45] Nov. 27, 1979

[54] ELECTRICALLY CONDUCTIVE BONDING STRAP FOR CONNECTING MOBILE PARTS

[75] Inventor: Arlo K. Palmer, Renton, Wash.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 891,873

[22] Filed: Mar. 30, 1978

[51] Int. Cl.² H02G 13/00

[52] U.S. Cl. 339/29 R; 174/2

[58] Field of Search 339/19, 28, 29, 222,

339/277; 174/2, 4, 5; 361/218; 244/1 A

[56] References Cited
U.S. PATENT DOCUMENTS

2,129,493	9/1938	Deems	238/14.13
2,286,415	6/1942	Hewel	339/29 B
2,623,918	12/1952	Hartwell	174/2

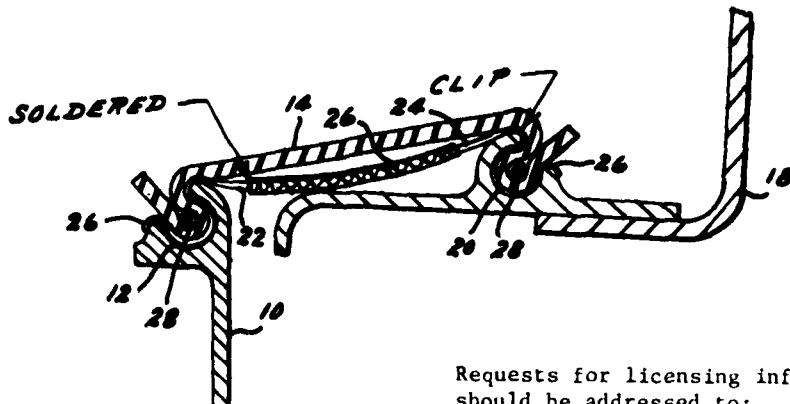
Primary Examiner—Neil Abrams
Attorney, Agent, or Firm—Joseph E. Ruiz; Henry S. Miller

[57] ABSTRACT

The invention comprises a braided wire having a shaped clip soldered or otherwise connected to each end. The clip is so formed as to follow the shape of a retainer which is designed to secure a rubber weather seal by means of a cable and groove arrangement.

5 Claims, 2 Drawing Figures

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United States Patent [19]

Kuhn, Jr.

[11] 4,175,835
[45] Nov. 27, 1979

- [54] **FLOATING HEAD LASER MIRROR ASSEMBLY**
- [75] Inventor: Ralph F. Kuhn, Jr., Calabasas, Calif.
- [73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
- [21] Appl. No: 926,358
- [22] Filed: Jul. 20, 1978
- [51] Int. Cl.² G02B 7/18
- [52] U.S. Cl. 350/310
- [58] Field of Search 350/310, 288

[56] References Cited

U.S. PATENT DOCUMENTS

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|-----------|---------|-------------------|---------|
| 1,801,285 | 4/1931 | Mills | 350/310 |
| 3,637,296 | 1/1972 | McLafferty et al. | 350/310 |
| 3,676,274 | 7/1972 | Matulis | 350/310 |
| 3,708,223 | 1/1973 | Sorensen et al. | 350/310 |
| 3,731,992 | 5/1973 | Mansell | 350/310 |
| 1,781,094 | 12/1973 | Griest | 350/310 |

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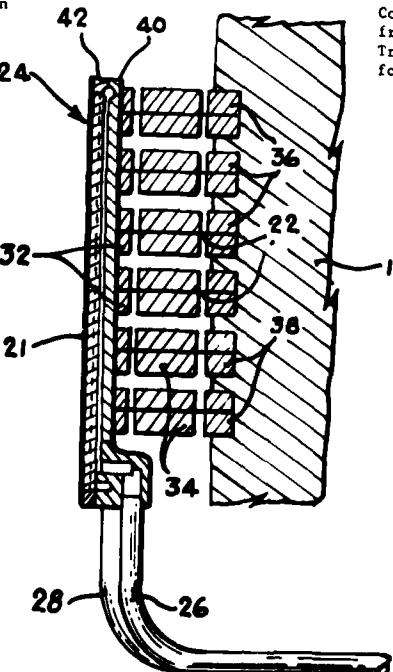
Primary Examiner—Jon W. Henry
Attorney, Agent, or Firm—Joseph E. Rusz; Jacob N. Erlich

[57] ABSTRACT

A high power floating head laser mirror assembly having a mirror head, a base structure and a plurality of flexure elements interposed between the mirror head and the base structure for "floatingly" supporting the mirror head with respect to the base structure. In order to preserve proper mirror head alignment and yet allow radial expansion of the mirror head a plurality of posts are located adjacent the flexure elements thereby exposing only a predetermined portion of the flexure element. As a result of the above assembly, the mirror surface is capable of reliable operation within a laser having a light intensity in excess of 5 Kw/cm².

9 Claims, 4 Drawing Figures

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JAT 00140

R&D RECORD (Patent Abstract)

AFSC — Andrews AFB Md 1978



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United States Patent [19]

Harvey et al.

4,177,227

Dec. 4, 1979

[54] **LOW SHEAR MIXING PROCESS FOR THE MANUFACTURE OF SOLID PROPELLANTS**

[75] **Inventors:** Kenneth L. Harvey, Pleasant Grove; Howard D. Dixon, Salt Lake City, both of Utah

[73] **Assignee:** The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] **Appl. No.:** 612,435

[22] **Filed:** Sep. 10, 1975

[51] **Int. Cl.²** C06B 45/10

[52] **U.S. Cl.** 264/3 R; 149/19.1;

149/19.9; 149/19.92

[58] **Field of Search** 149/7, 19.9, 19.92, 149/19.1; 264/3 R

[56] **References Cited**

U.S. PATENT DOCUMENTS

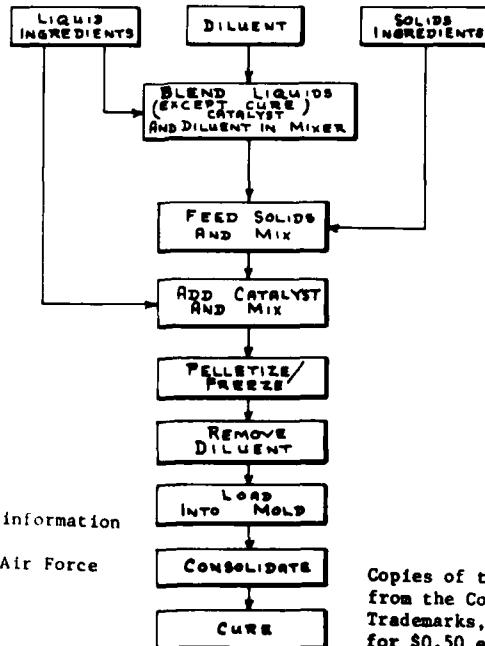
3,685,163	8/1972	Olt	149/19.92 X
3,730,792	5/1973	Frost et al.	149/19.9
3,801,385	4/1974	Mastrolia et al.	149/19.9
3,834,957	9/1974	McDevitt et al.	264/3 R X
3,870,578	3/1975	Nichols	264/3 R X
3,892,610	7/1975	Huzinec	149/19.92 X

Primary Examiner—Edward A. Miller
Attorney, Agent, or Firm—Joseph E. Rusz; William J. O'Brien

[57] **ABSTRACT**

A low shear mixing process for preparing high solids, high viscosity rocket propellants in which the propellant ingredients are blended with an inert diluent to reduce the high shear mixing environment generated by conventional mixing techniques. The diluent is then removed by sublimation from the mixture through a freeze drying process prior to curing and casting the mix according to conventional techniques.

2 Claims, 1 Drawing Figure



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United States Patent [19]

Mazdiyani

[11] 4,177,230
[45] Dec. 4, 1979

[54] PROCESS FOR PRODUCING REACTION
SINTERED SILICON NITRIDE OF
INCREASED DENSITY

[75] Inventor: Kheirkhah S. Mazdiyani, Xenia,
Ohio

[73] Assignee: The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.

[21] Appl. No.: 911,746

[22] Filed: Jun. 2, 1978

[51] Int. Cl.² C04B 35/56; C04B 35/58;
C01B 21/06

[52] U.S. Cl. 264/68; 106/44;
106/73.5; 264/65; 264/66; 423/344; 423/406

[56] Field of Search 423/344, 406; 106/44;
106/73.5; 264/60, 65, 66

[56] References Cited

U.S. PATENT DOCUMENTS

3,892,583 7/1975 Winter et al. 106/44

FOREIGN PATENT DOCUMENTS

2,236,078 3/1974 Fed. Rep. of Germany 106/44
1,432,559 4/1976 United Kingdom 423/344

Primary Examiner—Jack Cooper
Attorney, Agent, or Firm—Joseph E. Rusz; Cedric H.
Kuhn

[57] ABSTRACT

Porous reaction sintered silicon nitride body is infiltrated with an organosilicon compound after which the body is heated at a temperature sufficient to decompose the infiltrated material, resulting in a silicon nitride body having an increased density and significantly improved room temperature strength.

3 Claims, No Drawings

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United States Patent [19]

Beeler

[11] **4,177,308**
[45] **Dec. 4, 1979**

[54] **NON-COMBUSTIBLE HIGH
TEMPERATURE ABRADABLE SEAL
MATERIAL**

[75] **Inventor:** David R. Beeler, Fairfield, Ohio

[73] **Assignee:** The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.

[21] **Appl. No.:** 932,814

[22] **Filed:** Aug. 10, 1978

[51] **Int. CL²** C04B 21/00

[52] **U.S. Cl.** 428/117; 106/40 R

[58] **Field of Search** 106/40 R, 40 V;

[56] **References Cited**

U.S. PATENT DOCUMENTS

3,041,205 6/1962 Ille 106/40 R
3,068,016 12/1962 Dega 428/117
3,126,149 3/1964 Bowers, Jr. et al. 428/117
3,991,254 11/1976 Takeuchi 106/40 R

Primary Examiner—O. R. Vertiz

Assistant Examiner—Mark Zell

*Attorney, Agent, or Firm—Joseph E. Rusz; Cedric H.
Kuhn*

[57] **ABSTRACT**

A non-combustible, abradable sealant composition for
jet engines comprising a major amount of aluminum
phosphate and a minor amount of silica or glass micro-
spheres.

11 Claims, No Drawings

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United States Patent [19]

Rogers

[1] 4,177,328

Dec. 4, 1979

[54] WALL WICK FOR NICKEL-HYDROGEN CELL

3,532,549	10/1970	Bradley et al.	429/101
3,615,845	10/1971	Gray	429/34
4,004,067	1/1972	Hriggs et al.	429/101

[75] Inventor: **Howard H. Rogers**, Culver City,
Calif.

*Primary Examiner—Donald L. Walton
Attorney, Agent, or Firm—Joseph E. Rusz; Robert Kern
Duncan*

[21] Appl. No.: 030 910

[22] Filed: Dec. 19, 1978

(1) Int. C. 1
MARCH 10/21

[51] Int. Cl.: H01M 12/08
[52] U.S. C: 439/81; 439/101

[52] U.S. Cl. 429/81, 429/101
[58] **Field of Search** 429/38, 39, 81, 34,
429/101, 144, 145, 59, 33, 247, 72

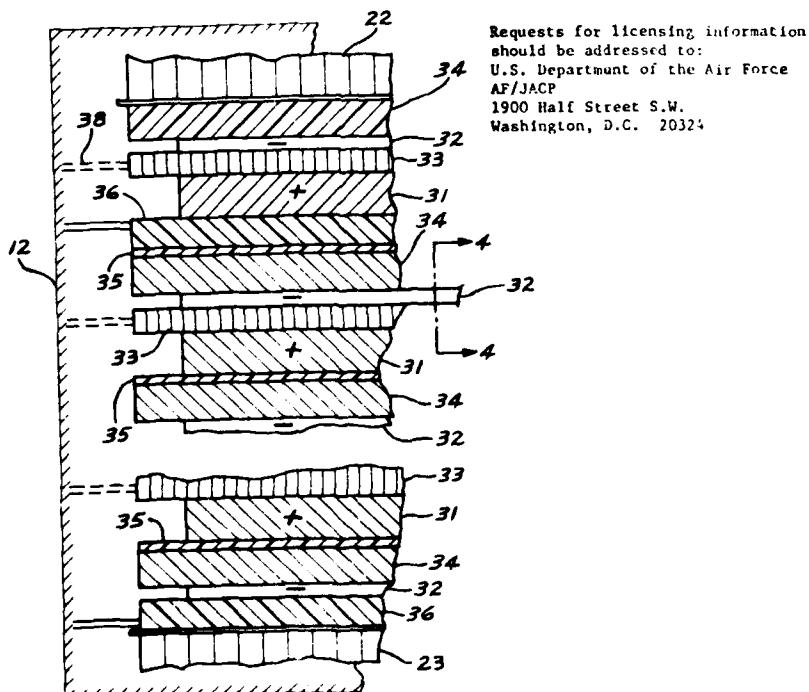
References Cited

U.S. PATENT DOCUMENTS

ABSTRACT

Electrolyte, lost from the stack to the case in a sealed electrochemical cell, is returned to the stack by a zirconium oxide based ceramic deposited on the inside wall of the pressure vessel, wicking by capillary action, the electrolyte from regions external to the stack to the stack components. The ceramic wick is also used to transfer electrolyte from one separator and/or reservoir to another within the stack, replacing an interior stack wick in a recirculating design. The wall wick is also effective in a back-to-back type cell design.

3 Claims, 4 Drawing Figures



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United States Patent [19]

McLaughlin et al.

[11] **4,177,437**
[45] Dec. 4, 1979

[54] **HIGH POWER PRE-TR SWITCH**

[75] Inventors: James F. McLaughlin, Severna Park; Harry Goldie, Randallstown, both of Md.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 871,066

[22] Filed: Jan. 20, 1978

[51] Int. Cl.² H01P 1/14
[52] U.S. Cl. 333/13; 313/221;
315/111.2

[58] Field of Search 333/13; 313/180, 221,
313/222, 229, 231.3, 480; 315/39, 111.2

[56] **References Cited**

U.S. PATENT DOCUMENTS

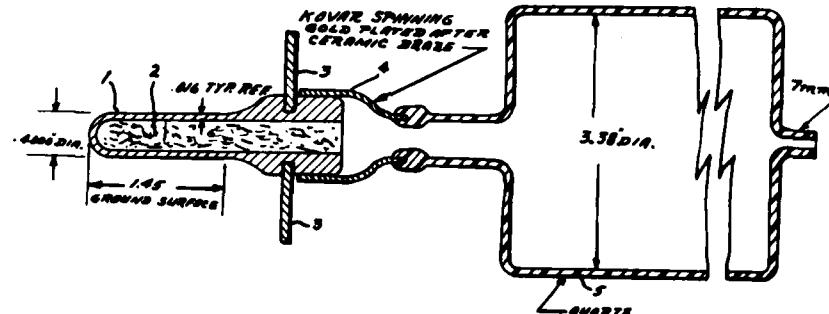
3,219,868	11/1965	Mason et al.	313/221 X
3,497,833	2/1970	Goldie et al.	333/13
3,648,100	3/1972	Goldie et al.	315/39
3,705,319	12/1972	Goldie et al.	333/13 X
3,753,158	8/1973	Prescott	333/13
4,120,808	10/1978	Byrum, Jr. et al.	313/221 X

Primary Examiner—Paul L. Gensler
Attorney, Agent, or Firm—Joseph E. Rusz; George Fine

[57] **ABSTRACT**

A high power pre-TR switch utilizes hot pressed boron nitride to form a vial. The vial contains a halogen gas such as chlorine.

1 Claim, 1 Drawing Figure



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JAT 00145



PATENT
ABSTRACT

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United States Patent [19]

Masak

[11] 4,177,464
[45] Dec. 4, 1979

[54] MULTIPLEXING OF MULTIPLE LOOP
SIDELOBE CANCELLERS

[75] Inventor: Raymond J. Masak, East Northport,
N.Y.

[73] Assignee: The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.

[21] Appl. No.: 960,207

[22] Filed: Nov. 13, 1978

[51] Int. Cl.¹ G01S 3/06

[52] U.S. Cl. 343/100 LE

[58] Field of Search 343/100 LE

[56] References Cited

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Primary Examiner—Maynard R. Wilbur

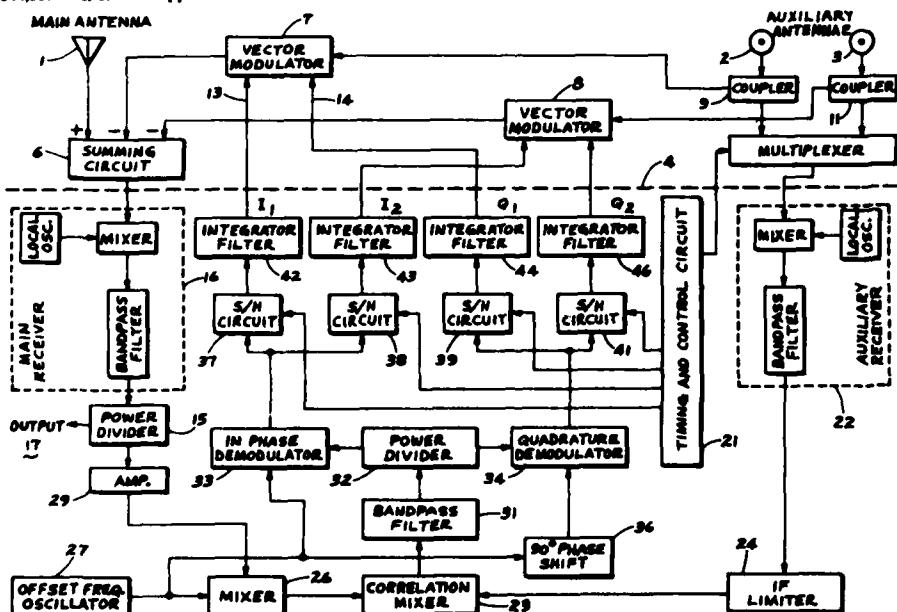
Assistant Examiner—Richard E. Berger

Attorney, Agent, or Firm—Joseph E. Rusz; Casimer K. Salys

[57] ABSTRACT

A sidelobe canceller in which the undesired signals in the main antenna channel are cancelled at RF using signals from multiple auxiliary antennas, where each auxiliary antenna signal has been weighted in a vector modulator while at RF. The weighting is determined in a single wideband IF loop by multiplexing the multiple auxiliary antenna signals through the same auxiliary receiver, correlator and demodulator. The demodulated output signal from each auxiliary antenna is sampled and retained as a weighting to adjust the vector modulator for the corresponding auxiliary antenna. A timing and control circuit coordinates the multiplexing and sampling functions.

3 Claims, 1 Drawing Figure



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United States Patent [19]

Lundvall, I et al.

[11] 4,177,465

[45] Dec. 4, 1979

[54] NEAR-RANGE PERSONNEL BEACON LOCATOR APPARATUS

[75] Inventors: Donald O. Lundvall, I, Papillion; John P. Engle; Robert R. Yescomis, both of Omaha, all of Nebr.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 949,189

[22] Filed: Oct. 6, 1978

[51] Int. Cl. 2 G01S 11/00

[52] U.S. Cl. 343/112 D

[58] Field of Search 343/112 D

[56] References Cited
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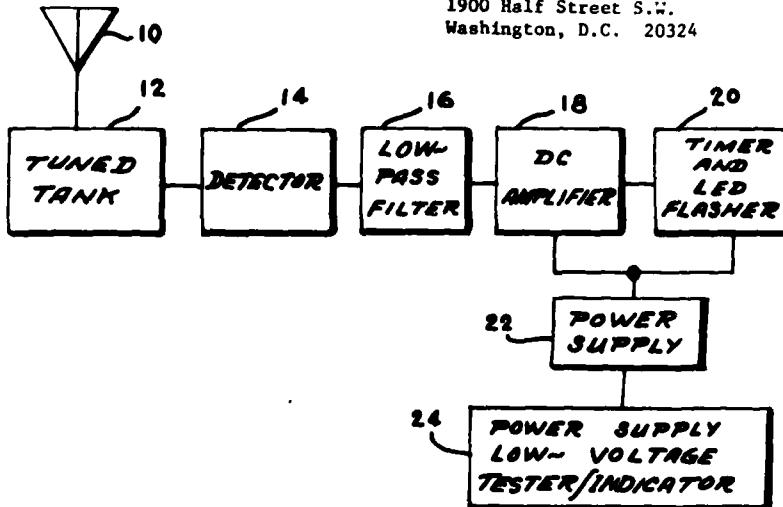
Primary Examiner—Maynard R. Wilbur
Assistant Examiner—Richard E. Berger
Attorney, Agent, or Firm—Joseph E. Russ; William Stepanishen

[57] ABSTRACT

A near-range personnel beacon locator apparatus utilizing a tuned tank circuit to receive the emitted signal from an activated personnel beacon. The detected signal is applied to a D.C. amplifier to provide a D.C. level which drives a controlled variable duty cycle timer for driving a light emitting diode indicator.

7 Claims, 4 Drawing Figures

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United States Patent [19]

Bliamptis

[11] 4,177,493
[45] Dec. 4, 1979

[54] HIGH VOLTAGE ANTENNA PROTECTION
SYSTEM

[75] Inventor: Emmanuel E. Bliamptis, Lexington, Mass.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 568,753

[22] Filed: Dec. 29, 1977

[51] Int. Cl. 2 H02H 7/20

[52] U.S. Cl. 361/56; 333/12;

343/904; 361/117; 361/118; 361/133

[58] Field of Search 361/56, 54, 43, 118,
361/119, 117, 133, 134, 129, 212, 220, 221;
333/12, 17 L; 324/109; 343/720, 851, 904, 905,
906

[56] References Cited

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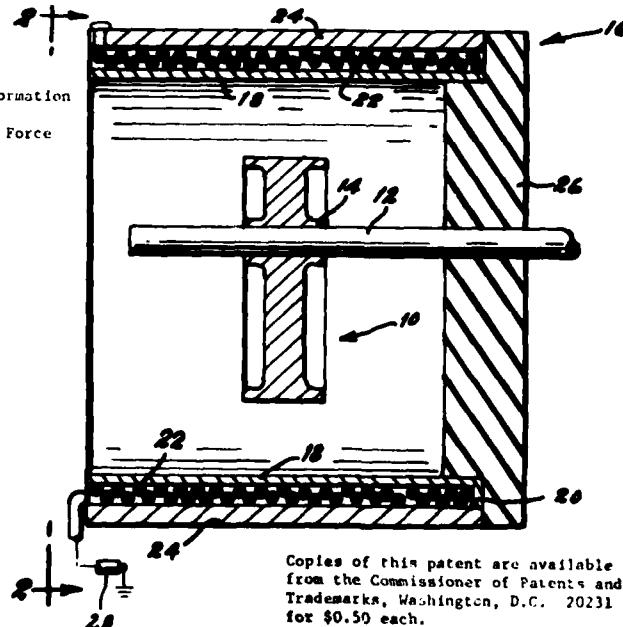
171666 6/1952 Fed. Rep. of Germany 361/133

Primary Examiner—Patrick R. Salce
Attorney, Agent, or Firm—Joseph E. Ruaz; Henry S.
Miller

[57] ABSTRACT

A device for the protection of antennas against lightning and electromagnetic pulse consisting of an electrically conducting rotor that is free to turn on a conducting shaft which is connected to the antenna. This combination is placed within an electric coil with one end connected to ground. The rotor is mounted eccentrically within the coil so that when a predetermined critical voltage on the antenna is exceeded electrical current flows through the rotor, and coil to ground via the air gap separating the rotor and coil, a magnetic field is set up in the coil which turns the rotor and reduces the air gap as the voltage is dissipated, after discharge of the surge, the rotor returns to its quiescent position.

5 Claims, 2 Drawing Figures



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United States Patent [19]

Wess

[11] **4,177,681**
[45] **Dec. 11, 1979**

**[54] APPARATUS FOR ADJUSTING AND
LOCKING A LINEAR ACTUATOR**

[75] Inventor: Thomas B. Wess, Cincinnati, Ohio

[73] Assignee: The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.

[21] Appl. No.: 893,868

[22] Filed: Apr. 6, 1978

[51] Int. Cl.: F16H 21/44; F16H 21/54;
F16H 25/18

[52] U.S. Cl.: 74/110; 74/522;
74/586; 92/13.41; 92/13.8; 244/85; 403/118;
403/320

[58] Field of Search: 244/85; 92/13.41, 13.8,
92/13.4; 188/196 A, 196 C; 100/257; 74/522,
110, 586; 403/118, 320, 343

[56] References Cited

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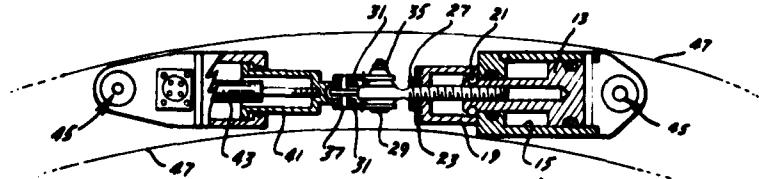
19963	3/1972	Australia	92/13.8
421989	3/1911	France	74/586
32395	11/1927	France	403/343
724755	2/1955	United Kingdom	244/226

Primary Examiner—Leslie Braun
Attorney, Agent, or Firm—Joseph E. Rusz; Arsen
Tashjian

[57] ABSTRACT

A cylindrical linear actuator suitable for installation in a confined area and capable of infinite stroke adjustment over its scheduled travel and lockable at any position of its designated stroke includes overlapping and combining rod end stroke adjustments to minimize actuator length. Electrical feedback is precalibrated to give a known signal proportional to the actuator stroke and to the position of the load clevis thereby always giving the correct position of the load.

3 Claims, 2 Drawing Figures



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United States Patent [19]

Arnold et al.

[11] 4,178,428

[45] Dec. 11, 1979

[54] THERMALLY STABLE ENYNE
POLYSULFONE POLYMERS

[75] Inventors: Fred E. Arnold, Centerville; Bruce A. Reinhardt, New Carlisle, both of Ohio

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 946,291

[22] Filed: Sep. 27, 1978

[51] Int. Cl.² C08G 75/23

[52] U.S. Cl. 528/174; 260/30.8 R;
260/607 AR; 428/411; 528/125; 528/126;
528/128

[58] Field of Search 528/174, 125, 126, 128;
260/30.8 R, 607 AR

[56] References Cited

U.S. PATENT DOCUMENTS

4,108,926 12/1978 Arnold et al. 528/174

Primary Examiner—Lester L. Lee
Attorney, Agent, or Firm—Joseph E. Rusz; Cedric H. Kuhn

[57] ABSTRACT

High molecular weight enyne polysulfone thermoplastics are prepared by the reaction of alkali metal salts of 1,4-bis(3-hydroxyphenyl)-buta-1-ene-3-yne and various aromatic diols with aromatic dihalosulfones. Because of the presence of the enyne moiety in the polymer backbone, the polymer can be lightly crosslinked to provide solvent resistant thermoplastics. The polymers are useful in fabricating graphite thermoplastic composites for structural applications.

9 Claims, No Drawings

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United States Patent [19]

Friedman et al.

[11] 4,179,190
[45] Dec. 18, 1979

[54] WIDE BAND ADJUSTABLE BREWSTER ANGLE POLARIZER

[75] Inventors: Jerome D. Friedman; Carl A. Pitha, both of Lexington, Mass.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 866,742

[22] Filed: Jan. 3, 1978

[51] Int. Cl. 2 G02B 5/30

[52] U.S. Cl. 350/152

[58] Field of Search 350/152

[56] References Cited

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Primary Examiner—John K. Corbin

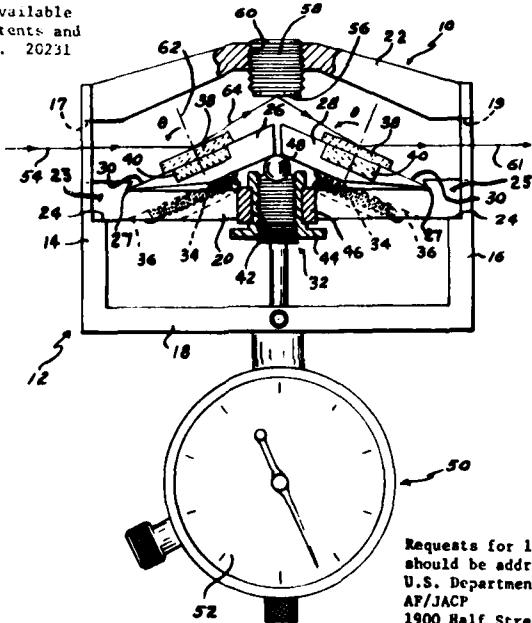
Assistant Examiner—R. A. Rosenberger

Attorney, Agent, or Firm—Joseph E. Ruiz; Jacob N. Erlich

[57] ABSTRACT

A wide band adjustable Brewster angle polarizer having a pair of dielectric elements adjustably mounted within a housing. A dial micrometer is operably attached to the means for adjusting the angular relationship between the normal to the dielectric material and an incoming beam of unpolarized light. The micrometer is calibrated in direct relationship between the wavelength of the incoming beam of light and the establishment of a Brewster angle between the normal to the dielectric material and the incoming beam. Thereby, by proper selection of the dielectric material, light ranging from the ultraviolet to the infrared range of the optical spectrum can be quickly and reliably polarized.

8 Claims, 1 Drawing Figure





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United States Patent [19]

Hobbs

[11] 4,179,657
[45] Dec. 18, 1979

[54] ANTI-JAMMING COMMUNICATION SYSTEM

[75] Inventor: Charles F. Hobbs, Medford, Mass.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 757,885

[22] Filed: Aug. 28, 1958

[51] Int. Cl.² H04K 1/00; H04L 9/00

[52] U.S. Cl. 325/33; 178/22

[58] Field of Search 179/15 AS; 325/33;

178/22, 5.1

[56] References Cited

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2,952,735	9/1960	Weiss	250/6.6

Primary Examiner—S. C. Buczinski

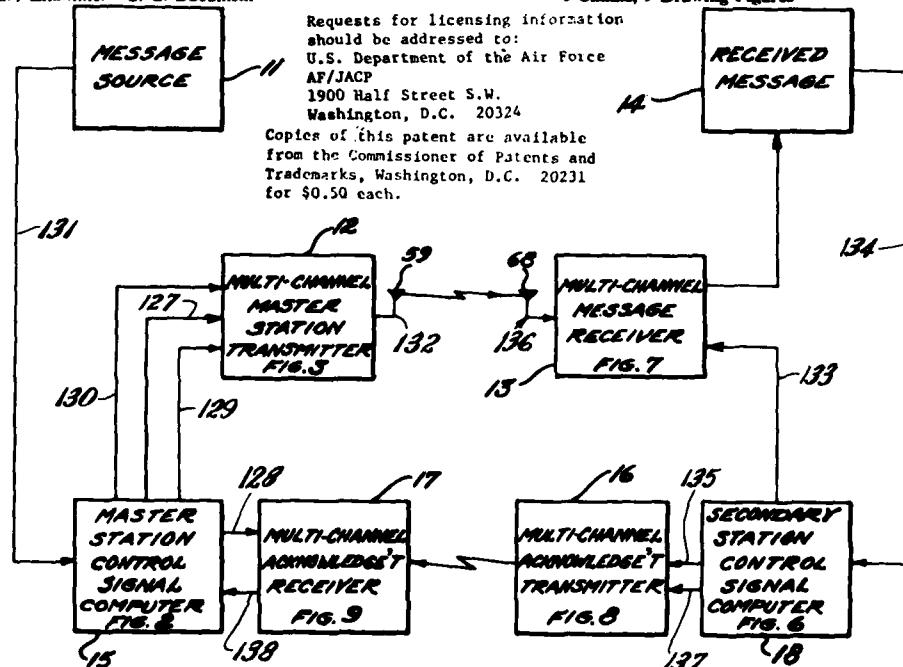
Attorney, Agent, or Firm—Joseph E. Rusz; George Fine
EXEMPLARY CLAIM

1. A system of communications to an intended destination in a manner to elude detection by unauthorized sources, and to prevent jamming, which comprises multi-channel transmitting means, each of said channel transmitting means having a different frequency and delay, said frequency and delay being variable, means to generate time and address digits, means to encipher said time and address digits, means to initially set the frequencies and delays in each of said transmitting channels, said setting means receiving said enciphered time and address digits, means to convert a message to be transmitted into digital bits, means to encipher said message digital bits, means for multiple transmission of the initial message digital bit after said setting of channels, and means to successively reset the frequency and delay in each of said transmitting channels after said multiple transmission of said first message digital bit, said resetting means receiving successive enciphered message digital bits until said message is completely transmitted.

6 Claims, 9 Drawing Figures

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United States Patent [19]

Fritts

[11] 4,179,799

[45] Dec. 25, 1979

[54] METHOD OF MOLDING A DOUBLE CATHODE HAVING A SENSING GRID FOR A POROUS ELECTRODE PRIMARY BATTERY

[75] Inventor: David H. Fritts, Dayton, Ohio

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 896,863

[22] Filed: Apr. 17, 1978

Related U.S. Application Data

[62] Division of Ser. No. 844,162, Oct. 21, 1977, Pat. No. 4,126,735.

[51] Int. Cl.¹ H01M 4/08

[52] U.S. Cl. 29/623.5; 264/105;

429/91

[58] Field of Search 29/623.1, 623.5; 264/104, 105; 429/93, 91, 92, 233, 178, 218

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U.S. PATENT DOCUMENTS

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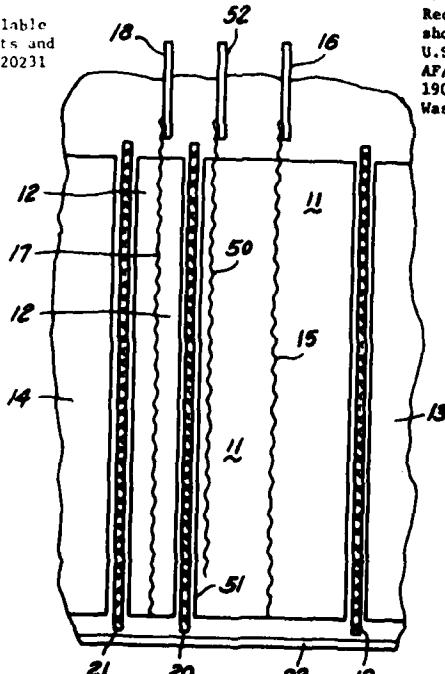
Primary Examiner—Daniel C. Crane
Attorney, Agent, or Firm—Joseph E. Rusz; Robert Kern Duncan

[57] ABSTRACT

In a porous electrode primary battery a sensing grid is positioned in a cell on or near the surface of the porous cathode facing the separator and anode. The voltage measured between this sensing grid and the conventional cathode current collector grid is a function of the current distribution within the electrode which is continuously changing as the battery discharges, thus the measured voltage is indicative of the state of charge of the particular cell having the sensing grid and for a battery containing cooperatively connected cells, the state of the battery in general.

1 Claim, 10 Drawing Figures

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United States Patent [19]

Hildebrand

[11] **4,180,329**
[45] **Dec. 25, 1979**

[54] **SINGLE BLADE PROXIMITY PROBE**

[75] Inventor: James R. Hildebrand, Palm Beach Gardens, Fla.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 889,795

[22] Filed: Mar. 23, 1978

[51] Int. Cl. 2 G01B 11/14
[52] U.S. Cl. 356/375; 250/224;
356/23; 415/118

[58] Field of Search 356/372, 373, 375, 426,
356/23; 73/655; 415/118; 250/224, 561;
358/106-108

[56] **References Cited**

U.S. PATENT DOCUMENTS

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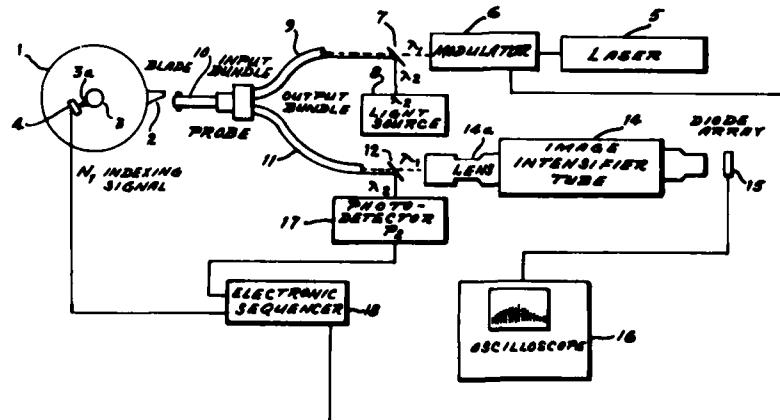
Primary Examiner—F. L. Evans
Attorney, Agent, or Firm—Joseph E. Rusz; Willard R. Matthews, Jr.

[57] **ABSTRACT**

A single blade proximity probe uses fiber optics to direct a laser output at turbine engine blades and to return the reflected light to an image intensifier probe which provides an output indicative of blade clearance. To enable the system to measure the clearance of a single blade tip on an operating turbine, a second light beam having a different wavelength from the laser output is directed over the laser light path to count the blades and to strobe the laser on the desired blade.

2 Claims, 1 Drawing Figure

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United States Patent [19]

Abraham et al.

[11] 4,180,725

[45] Dec. 25, 1979

[54] GATING APPARATUS FOR STATIC
CROSSED FIELD PHOTOMULTIPLIERS

[56] References Cited

U.S. PATENT DOCUMENTS

3,431,420 3/1969 Fisher 250/207

Primary Examiner--David C. Nelms

Assistant Examiner--Darwin R. Hostetter

Attorney, Agent, or Firm--Joseph E. Rusz; Sherman H. Goldman

[75] Inventors: Wayne G. Abraham, Los Altos Hills;
Richard S. Eack, Jr., San Jose, both
of Calif.; Ronald H. Goehner, Wayne,
N.J.; Robert V. Brick, Sunnyvale,
Calif.

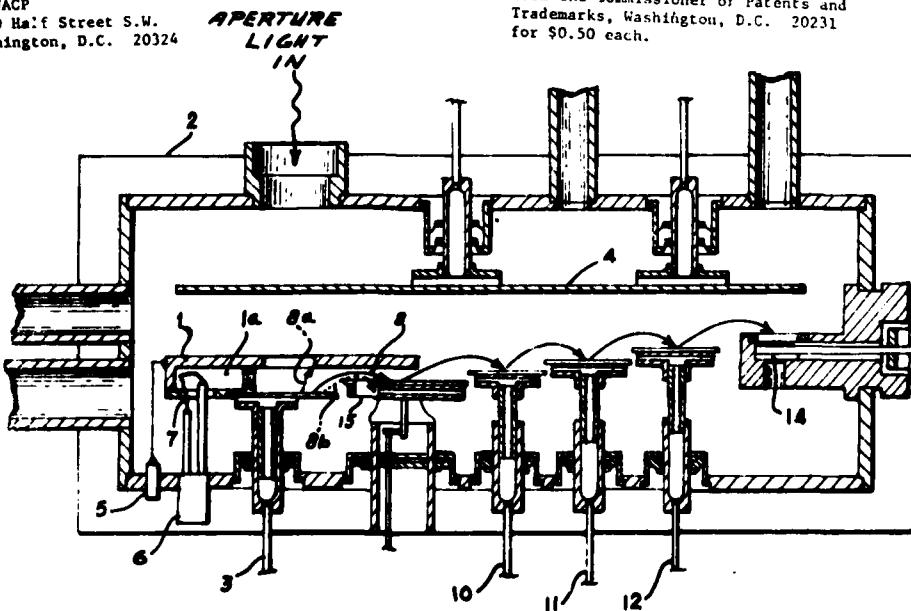
[57] ABSTRACT

Gating apparatus for a static crossed field photomultiplier utilizes a gating electrode which is mounted in a position between the cathode and the rail electrode. The gating electrode is pulsed thus causing the cathode current to be either multiplied or diverted so as to modulate the current by shifting the cathode beam into and out of the dynode area where secondary amplification occurs.

4 Claims, 1 Drawing Figure

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United States Patent [19]

Hook et al.

[11] 4,180,779
[45] Dec. 25, 1979

[54] QPSK DEMODULATOR WITH TWO-STEP QUADRUPLER AND/OR TIME-MULTIPLEXING QUADRUPLING

[75] Inventors: William R. Hook, Los Angeles; Ronald P. Hilberg, Redondo Beach, both of Calif.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 944,440

[22] Filed: Sep. 21, 1978

[51] Int. Cl. 2 H04L 27/22

[52] U.S. Cl. 329/50; 325/320; 325/346; 329/122

[58] Field of Search 329/50, 104, 110, 122, 329/124; 325/320, 346, 349

[56]

References Cited

U.S. PATENT DOCUMENTS

4,097,813 6/1978 Otani et al. 329/124 X

Primary Examiner—Siegfried H. Grimm
Attorney, Agent, or Firm—Joseph E. Rusz; William Stepanishen

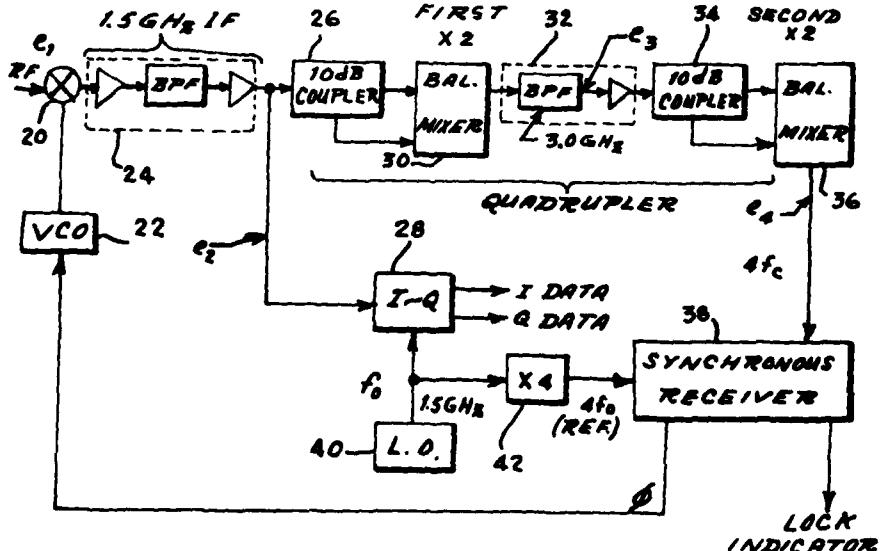
[57]

ABSTRACT

A QPSK demodulator apparatus utilizing a pair of doubling units in tandem but separated by a bandpass filter to remove any undesired cross products and to eliminate possible noise signal that may be applied to the second doubler. The use of two doubling units to provide a times 4 quadrupling allows the use of heterodyning in order to operate at a lower frequency.

7 Claims, 7 Drawing Figures

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ABSTRACT

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United States Patent [19]

Williamson et al.

[11] 4,181,435
[45] Jan. 1, 1980

[54] HOLOGRAPHIC FIELD LENS DETECTOR

[75] Inventors: Tommy L. Williamson, Kettering; Harold W. Rose, Xenia, both of Ohio

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 373,527

[22] Filed: Jun. 29, 1973

[51] Int. Cl.² G01B 11/26; G02B 5/18

[52] U.S. Cl. 356/141; 350/3.72;

350/162 ZP; 356/152

[56] Field of Search 356/141, 152; 350/3.5, 350/162 ZP, 3.72

[56] References Cited

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| 3,375,750 | 4/1968 | Ellis et al. | | 356/152 |
| 3,478,219 | 11/1969 | Nutz | | 356/152 |
| 3,701,602 | 10/1972 | Bergin et al. | | 356/152 |

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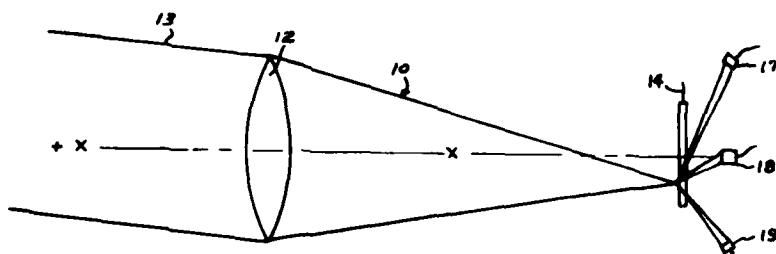
Sincerbox, IBM Tech. Discl. Bulletin, 8-1967, pp. 267, 268.

Primary Examiner—S. C. Buczinski
Attorney, Agent, or Firm—Joseph E. Rusz; Richard J. Killoren

[57] ABSTRACT

A holographic field lens detector system having an objective lens for focusing incoming light from a distant illuminating source upon a holographic lens positioned at the back focal plane of the objective lens. The aperture of the objective lens is simultaneously imaged on four detectors positioned in back of the holographic lens and on the four sides of holographic lens. The output of opposite pairs of detectors are fed to sum and difference circuits with the output of the sum and difference circuits being supplied to divide circuits to provide X and Y position information for the illumination on the holographic lens.

2 Claims, 5 Drawing Figures



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JAT 00157

AFSC -- Andrews AFB Md 1978



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United States Patent [19]

Fujishiro et al.

[11] 4,181,590

[45] Jan. 1, 1980

[54] METHOD OF ION PLATING TITANIUM
AND TITANIUM ALLOYS WITH NOBLE
METALS AND THEIR ALLOYS

[75] Inventors: Shiro Fujishiro, Yellow Springs;
Daniel Eylon, Dayton, both of Ohio

[73] Assignee: The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.

[21] Appl. No.: 941,714

[22] Filed: Sep. 12, 1978

Related U.S. Application Data

[62] Division of Ser. No. 825,005, Aug. 16, 1977, Pat. No.
4,137,370.

[51] Int. CL² C23C 15/00

[52] U.S. Cl. 204/192 N; 427/38

[58] Field of Search 204/192 N; 427/38;
428/670, 672, 674, 660

[56] References Cited

U.S. PATENT DOCUMENTS

3,514,388 5/1970 Brumfield et al. 204/192 N
3,928,159 12/1975 Takodoro et al. 204/192 N

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1900 Half Street S.W.
Washington, D.C. 20324

FOREIGN PATENT DOCUMENTS

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Schroeder et al., "Adherence and Porosity in Ion Plated Gold," J. Electrochem. Soc. 9/67, pp. 889-892.
Murayama, "Structures of Gold Thin Films Formed by
Ion Plating," Jap. J. Appl. Phys., Suppl. 2, Pt. 1, 1974,
pp. 459-462.

IBM Technical Disclosure Bulletin, vol. 16, No. 1,
6/73, p. 39, Miller, "Multiple Reflow Ti-Pt Metal-
lurgy."

Primary Examiner—Arthur J. Steiner
Attorney, Agent, or Firm—Joseph E. Rusz; Cedric H.
Kuhn

[57] ABSTRACT

Components fabricated from titanium and titanium al-
loys are subjected to anion plating with noble metals or
their alloys. The structures so treated are highly resis-
tant to oxidation at elevated temperatures and possess
improved mechanical properties.

3 Claims, No Drawings

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JAT 00158



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United States Patent [19]

Psarras

4,181,678

[45] Jan. 1, 1980

- [54] SYMMETRICAL PERFLUOROALKYLENE OXIDE α,ω -DIACYL FLUORIDES
[75] Inventor: Theodore Psarras, Gainesville, Fla.
[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
[21] Appl. No.: 942,571
[22] Filed: Sep. 15, 1978
[51] Int. Cl.² C07C 53/20; C07C 51/58
[52] U.S. Cl. 260/544 F
[58] Field of Search 260/544 F, 543 F

[56]	References Cited		
U.S. PATENT DOCUMENTS			
3,250,806	5/1966	Warnell	260/535
3,317,484	5/1967	Fritz	260/78.4
3,318,911	5/1967	Takehara et al.	260/340.7
3,862,971	1/1975	Rudolph et al.	260/408

Primary Examiner—Gerald A. Schwartz
Attorney, Agent, or Firm—Joseph E. Rusz; Cedric H. Kuhn

[57] **ABSTRACT**

Symmetrical perfluoroalkylene oxide α,ω -diacyl fluoride is prepared by reacting a perfluoroalkylene oxide, α, ω -diiodide with fuming sulfuric acid in the presence of zinc sulfate while adding chlorine.

5 Claims, No Drawings

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United States Patent [19]

Psarras

[11] **4,181,679**
[45] **Jan. 1, 1980**

[54] **ω -IODOPERFLUOROALKYLENE OXIDE
ACYL FLUORIDES**

[75] **Inventor:** **Theodore Psarras, Gainesville, Fla.**

[73] **Assignee:** **The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.**

[21] **Appl. No.:** **954,943**

[22] **Filed:** **Oct. 24, 1978**

[51] **Int. Cl.:** **C07C 53/20; C07C 51/58**

[52] **U.S. Cl.:** **260/544 F**

[58] **Field of Search:** **260/544 F; 260/543 F**

[56] **References Cited**
U.S. PATENT DOCUMENTS

3,862,971 1/1975 Rudolph et al. 260/408

Primary Examiner—Gerald A. Schwartz
**Attorney, Agent, or Firm—Joseph E. Rusz; Cedric H.
Kuhn**

[57] **ABSTRACT**

ω -Iodoperfluoroalkylene oxide acyl fluorides are prepared by reacting a perfluoroalkylene oxide α,ω -diodide with fuming sulfuric acid in the presence of zinc sulfate. The iodacyl fluorides are intermediates for use in synthesizing perfluoroalkylene ether diimide esters.

4 Claims, No Drawings

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United States Patent [19]

Evers et al.

[11] 4,181,681

[45] Jan. 1, 1980

[54] 2-AMINO-4-ETHYNYLPHENOL

[75] Inventors: Robert C. Evers; George J. Moore,
both of Dayton, Ohio

[73] Assignee: The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.

[21] Appl. No.: 925,899

[22] Filed: Jul. 19, 1978

[51] Int. Cl.² C07C 91/44

[52] U.S. Cl. 260/575; 528/210

[58] Field of Search 260/575, 578, 571;
528/210

[56] References Cited

U.S. PATENT DOCUMENTS

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3,928,450 12/1975 Bilow et al. 260/571
3,981,932 9/1976 Diamond 260/578 X

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Morrison et al., "Organic Chemistry", 3rd edition, pp.
673 & 677 (1975).

Fieser et al., "Reagents for Organic Synthesis", vol. I,
pp. 441 & 1081 (1967).

Schofield et al., "Chemical Abstracts", vol. 44, Ab. No.
2992g (1950).

Cook et al., "Chemical Abstracts", vol. 58, Ab. No.
12390d (1963).

Primary Examiner—John Doll
Attorney, Agent, or Firm—Joseph E. Rusz; Cedric H.
Kuhn

[57] ABSTRACT

2-Amino-4-ethynylphenol, a novel compound, is prepared by a four-step synthetic sequence in which the key reaction is the treatment of 4-acetoxy-3-nitroacetophenone with a Vilsmeier reagent derived from N,N-dimethylformamide and phosphorus oxychloride. The compound is useful as an endcapping agent in the synthesis of fluorocarbon ether bibenzoxazole oligomers which, because of the presence of acetylenic terminal groups, can be cured by thermal means to provide broad-use temperature, fuel and fluid resistant vulcanizates.

2 Claims, No Drawings

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United States Patent [19]

Wendt et al.

[11] 4,181,774
[45] Jan. 1, 1980

[54] ELECTROMAGNETIC INTERFERENCE
FILTER WINDOW

[56] References Cited
U.S. PATENT DOCUMENTS

[75] Inventors: Jerry P. Wendt, Arcadia, Calif.;
Andrew J. Stecki, Ballston Spa, N.Y.

2,415,352	2/1947	Iams	350/153 X
3,569,858	3/1971	Wittman	331/94.5 G
3,671,286	6/1972	Fischell	428/332
3,815,036	6/1974	Nozik	350/1 X
3,920,533	11/1975	Pompei	204/192 P
3,935,351	1/1976	Franz	428/34
3,958,042	5/1976	Katsube et al.	427/162

[73] Assignee: The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.

Primary Examiner—Herbert, Jr., Thomas J.
Attorney, Agent, or Firm—Joseph E. Rusz; William J.
O'Brien

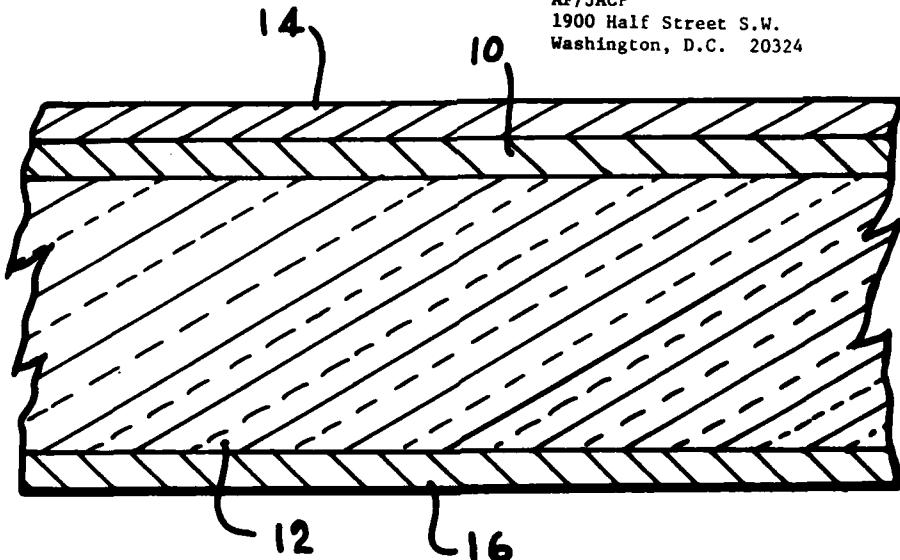
[21] Appl. No.: 970,947

[57] ABSTRACT

A laser window material for use in the infrared wavelength spectrum comprising a glass substrate having an indium tin oxide conductive film deposited in one surface thereof and magnesium fluoride antireflection films deposited atop the conductive film and the opposite surface of the glass substrate.

3 Claims, 1 Drawing Figure

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JAT 00162



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United States Patent [19]

Ehrenspock

[11] 4,183,027
[45] Jan. 8, 1980

[54] DUAL FREQUENCY BAND DIRECTIONAL
ANTENNA SYSTEM

[76] Inventor: Hermann W. Ehrenspock, 94
Parham St., Belmont, Mass. 02178
[21] Appl. No.: 935,948
[22] Filed: Aug. 18, 1978

Related U.S. Application Data

[63] Continuation of Ser. No. 840,449, Oct. 7, 1977, abandoned.
[51] Int. Cl.: H01Q 3/08
[52] U.S. Cl.: 343/724; 343/789
[58] Field of Search: 343/726, 725, 727, 728,
343/789, 837, 834-836, 817, 819

[56] References Cited
U.S. PATENT DOCUMENTS

3,438,043	4/1969	Ehrenspock	343/837
3,508,278	1/1970	Ehrenspock	343/837
3,605,104	9/1971	Weston et al.	343/837
3,742,513	6/1973	Ehrenspock	343/837

FOREIGN PATENT DOCUMENTS

630592 4/1948 United Kingdom 343/789

OTHER PUBLICATIONS

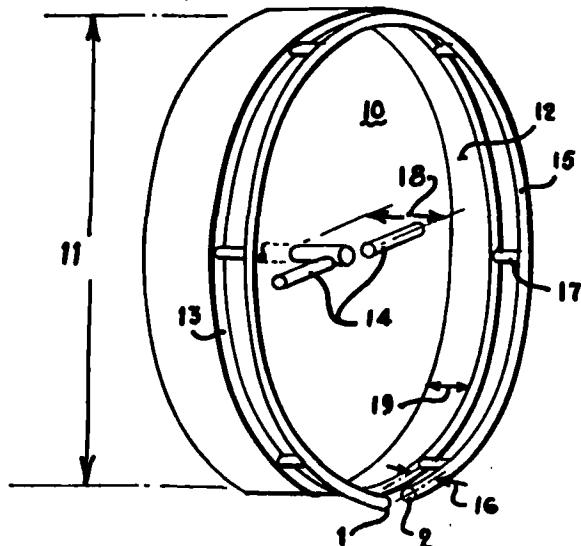
Terman's Electronic and Radio Engineering, 4th Edition, McGraw Hill, 1955, pp. 907 and 908.

Primary Examiner—David K. Moore
Attorney, Agent, or Firm—Joseph E. Ruiz; George Fine

[37] ABSTRACT

A dual frequency band directional antenna or system is in the form of a cavity reflector antenna mechanically combined and radiation-coupled with a loop of approximately the same shape and periphery as the rim edge of the cavity reflector, which loop is arranged outside and in front of, and in close proximity and parallel to the cavity rim edge, and, when properly energized, acts for the lower frequency band as a loop radiator with preselected field polarization, whereby the entire cavity structure serves two purposes by acting simultaneously as reflector for the higher frequency band cavity reflector antenna and for the lower frequency band, electrically separate loop radiator, with the radiation patterns of both sources being unidirectional over both frequency bands and with their radiation maxima directed into the center axis normal to the bottom plate of the cavity reflector structure.

17 Claims, 9 Drawing Figures



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United States Patent [19]

Mullally

[11] 4,184,125

[45] Jan. 15, 1980

[54] ANALOG TUNING VOLTAGE CIRCUIT
WITH ANALOG SIGNAL MULTIPLEXING

[56] References Cited
U.S. PATENT DOCUMENTS

[75] Inventor: James F. Mullally, Apalachin, N.Y.

3,155,670 11/1967 Pastoriza 330/86 UX
3,500,316 3/1970 Brown 330/46
3,622,904 11/1971 Knight 330/51 X
3,662,275 5/1972 Riley 330/51 X

[73] Assignee: The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.

Primary Examiner—James B. Mullins
Attorney, Agent, or Firm—Joseph E. Rusz; Robert Kern
Duncan

[21] Appl. No. 922,601

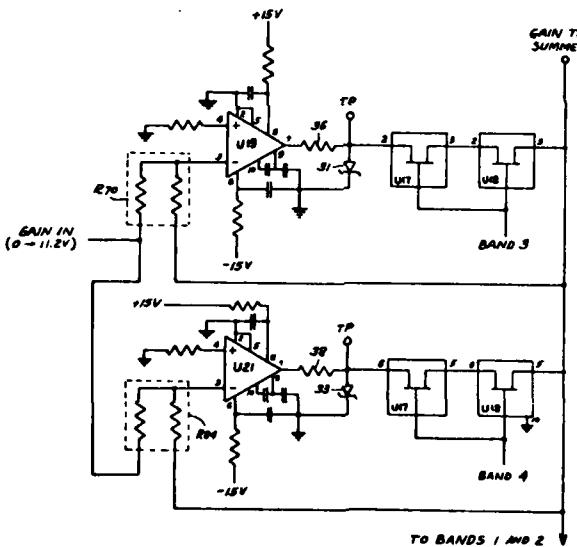
[57] ABSTRACT

[22] Filed: Jul. 7, 1978

Disclosed is an analog tuning circuit, suitable for multiplexing, having a field-effect transistor connected to the output of an operational amplifier with the drain connected in a feedback loop to the inverting input of the amplifier.

[51] Int. Cl. 2 H03G 3/00
[52] U.S. Cl. 330/282; 330/51;
330/84; 330/86; 330/295
[58] Field of Search 330/51, 84, 86, 110,
330/282, 295; 328/103, 154

1 Claim, 4 Drawing Figures



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United States Patent [19]

Smolinski et al.

4,184,821
[11] **Jan. 22, 1980**

[54] HIGH VELOCITY ROTARY VANE COOLING SYSTEM

[76] Inventors: Ronald E. Smolinski, 4081 Forest Ridge Blvd., Dayton, Ohio 45424; Kenneth P. Schwartz, 2604 N. Emerald, Fairborn, Ohio 45324

[21] Appl. No.: 932,812

[22] Filed: Aug. 10, 1978

[51] Int. Cl.: F04C 29/02

[52] U.S. Cl.: 418/93; 418/152; 418/264

[58] Field of Search: 418/152, 264

[56] References Cited

U.S. PATENT DOCUMENTS

2,498,029	2/1950	Clerc	418/264
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3,001,482	9/1961	Osborn	418/264 X

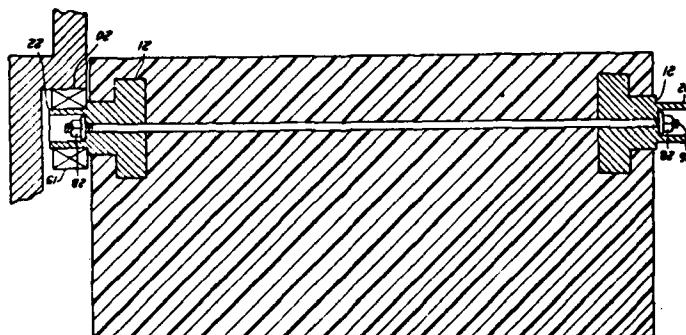
3,568,645	3/1971	Grimm	418/264
3,809,020	5/1974	Takianis	418/152 X
3,904,327	9/1975	Edwards et al.	418/152 X
4,088,426	5/1978	Edwards	418/152 X

Primary Examiner—Leonard E. Smith
Attorney, Agent, or Firm—Joseph E. Rusz; Richard J. Killoren

[57] ABSTRACT

A reverse Brayton cycle rotary vane cooling system having a compressor and an expander driven by a common shaft. The cooling system includes a plurality of vanes made of a carbon epoxy plastic composite with bearing support inserts molded into the plastic composite. A bolt passes through the bearing support inserts and plastic composite. Oil is supplied to the vane slots with any oil passing into the cooling gas being removed by oil separators.

3 Claims, 3 Drawing Figures



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United States Patent [19]

Miller

[11] 4,184,896

[45] Jan. 22, 1980

[54] SURFACE BARRIER TAILORING OF
SEMICONDUCTOR DEVICES UTILIZING
SCANNING ELECTRON MICROSCOPE
PRODUCED IONIZING RADIATION

3,888,701 6/1975 Taneja et al. 148/1.5
4,109,029 8/1978 Ozdemir et al. 250/492 A

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Donovan et al., "Radiation Hardening . . . Displacement Damage", J. Applied Physics, vol. 43, No. 6, Jun. 1972, pp. 2897-2899.

Broers et al., "Microcircuits by Electron Beam", Scientific America, Nov. 1972, pp. 34-44.

Bhatia et al., "Irradiation Technique . . . Charge-Coupled Storage Cell", I.B.M. Tech. Disc. Bull., vol. 15, No. 3, Aug. 1972, pp. 723-724.

Primary Examiner—L. Dewayne Rutledge

Assistant Examiner—W. G. Saba

Attorney, Agent, or Firm—Joseph E. Rusz; Henry S. Miller

[21] Appl. No.: 913,186

[22] Filed: Jun. 6, 1978

[51] Int. Cl.: H01L 21/36; H01L 21/324;
H01L 29/78

[52] U.S. Cl.: 148/1.5; 29/576 B;
250/492 A; 357/23; 357/24; 357/29; 357/52;
357/91

[58] Field of Search: 148/1.5; 250/492 A;
250/492 B; 29/576 B; 357/29, 52, 91, 24, 23;
427/35

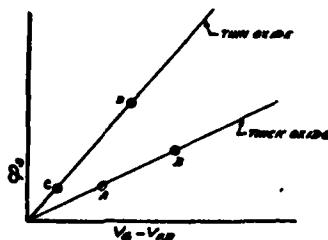
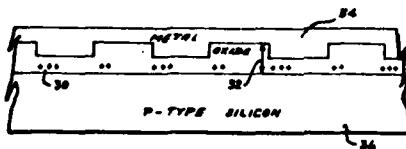
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3,691,376	9/1972	Bauerlein et al.	357/52 X
3,755,092	8/1973	Astubi	204/35 N
3,796,932	3/1974	Amadio et al.	357/24
3,829,961	8/1974	Bauerlein et al.	357/29
3,886,530	5/1975	Huber et al.	357/23 X

A method of spatially tailoring the surface barrier of MOS devices by means of a scanning electron microscope using ionizing radiation at the silicon dioxide-silicon interface to control the surface charge distribution. The MOS is subsequently annealed at about 300° C. for several hours to stabilize the surface potential.

1 Claim, 5 Drawing Figures



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PATENT
ABSTRACT

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United States Patent [19]

Gillman et al.

[11] **4,185,031**

[45] **Jan. 22, 1980**

[54] FLUORINATED PHOSPHINIC ACIDS

[75] Inventors: Hyman D. Gillman, East Vincent Township, Chester County; James P. King, Upper Gwynedd Township, Montgomery County, both of Pa.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 946,265

[22] Filed: Sep. 27, 1978

[51] Int. Cl.² C07F 9/30; C10M 1/44

[52] U.S. Cl. 260/502.4 R; 252/42.7;
260/429.3; 260/429.5; 260/438.5 R; 260/439 R

[58] Field of Search 260/502.4 R

[56] References Cited

U.S. PATENT DOCUMENTS

3,719,448 3/1973 Chance et al. 260/502.4 R

FOREIGN PATENT DOCUMENTS

1443533 3/1969 Fed. Rep. of Germany 260/502.4 R

Primary Examiner—Joseph E. Evans
Attorney, Agent, or Firm—Joseph E. Rusz; Cedric H. Kuhn

[57] ABSTRACT

Fluorinated phosphinic acids prepared by reaction of fluorinated olefins with an acid containing one or more P-H bonds in the presence of a free radical initiator. The reaction products of the acids with various metal centers are effective grease thickeners for liquid lubricants.

4 Claims, No Drawings

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United States Patent [19]

Griffin

[11] **4,185,041**
[45] **Jan. 22, 1980**

[54] CHANNEL SEALANT COMPOSITIONS

3,726,944 4/1973 Bennett et al. 260/23
4,000,166 12/1976 Witner et al. 260/824 R
4,026,839 5/1977 Dieck et al. 260/824 R
4,057,090 11/1977 Hoshikawa et al. 106/33

[75] Inventor: Warren R. Griffin, Dayton, Ohio
[73] Assignee: The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.

Primary Examiner—Wilbert J. Briggs, Sr.
Attorney, Agent, or Firm—Joseph E. Russ; Cedric H.
Kuhn

[21] Appl. No.: 830,227

[37] **ABSTRACT**

[22] Filed: Sep. 2, 1977
[51] Int. Cl.: C08L 85/02; C08L 83/08;
C08L 75/04
[52] U.S. Cl. 525/188; 525/474
[58] Field of Search 260/824 R, 823, 2,3,
260/858; 106/33

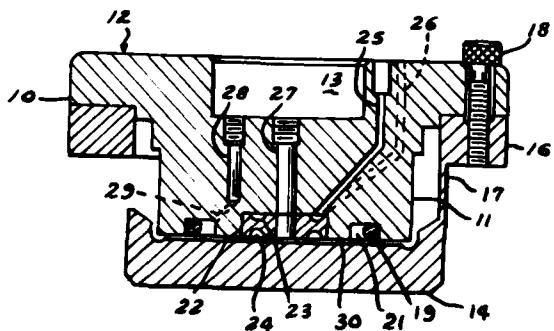
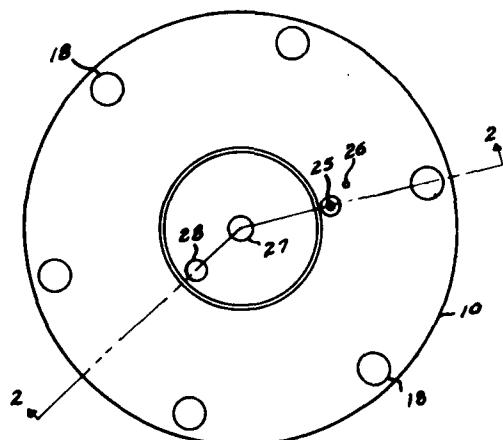
A sealant composition comprising a non-crosslinked, elastomeric mastic and an extrusion-inhibiting amount of vulcanized rubber particles of irregular shape and having sharp edges and angular surfaces. When the composition is used as a channel sealant, the ability of the particles to deform at structural gaps while offering resistance to extrusion prevents the loss of the elastomeric mastic.

[56] References Cited

U.S. PATENT DOCUMENTS

3,580,870 5/1971 Rosner 260/824 R
3,663,469 5/1972 Weismahr 260/858

6 Claims, 2 Drawing Figures



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United States Patent [19]

Harrison, Jr.

[11] 4,185,247

[45] Jan. 22, 1980

[34] MEANS FOR REDUCING SPURIOUS
FREQUENCIES IN A DIRECT FREQUENCY
SYNTHESIZER

[75] Inventor: Ernest R. Harrison, Jr.,
Crownsville, Md.

[73] Assignee: The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.

[21] Appl. No.: 866,743

[22] Filed: Jan. 3, 1978

[31] Int. Cl.: H03K 13/32

[52] U.S. Cl.: 328/165; 328/14

[58] Field of Search: 328/14, 155, 165

[36] References Cited

U.S. PATENT DOCUMENTS

3,882,403	5/1975	Gerken	.....	328/14
3,973,209	8/1976	Nosaen et al.	.....	328/14
3,976,945	8/1976	Cox	.....	328/14
4,011,516	3/1977	Hembigner et al.	.....	328/14

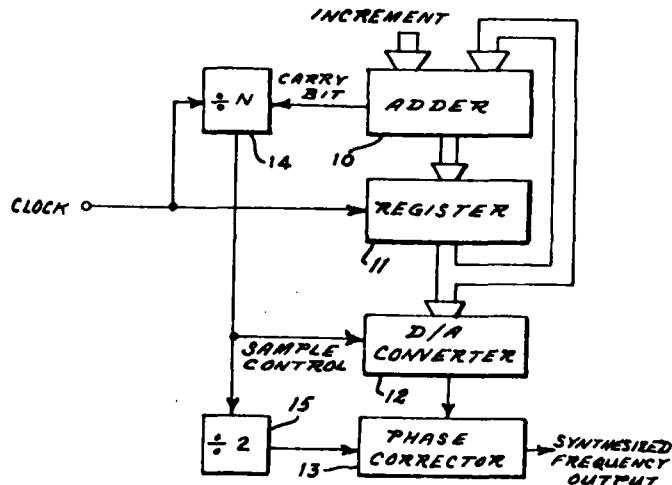
Primary Examiner—John S. Heyman

Attorney, Agent, or Firm—Joseph E. Rusz; George Fine

[57] ABSTRACT

Spurious frequencies are eliminated in a direct frequency synthesizer by means of a feed forward correction circuit. The improved direct frequency synthesizer of the invention includes a series adder, clocked register, a D/A converter and a phase corrector. The adder is inputted by a digital control increment and the output of the register. The system clock frequency is divided down by a smoothing counter that in part controls the phase of the output signal. Spurious frequencies are manifested by overflow of the register. The register overflow is converted to an analog signal by the D/A converter. The system output is provided by a voltage controlled oscillator that is controlled by an amplifier which is responsive to both the smoothing counter output and the analog output of the D/A converter. Additionally, the D/A converter is sampled twice for every cycle of output frequency, resulting in a doubling of the output frequency for a given D/A converter.

2 Claims, 4 Drawing Figures



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JAT 00169

AFSC — Andrews AFB Md 1978



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United States Patent [19]

Ernst

4,185,458

[45] Jan. 29, 1980

[54] TURBOFAN AUGMENTOR FLAMEHOLDER

[75] Inventor: Richard C. Ernst, North Palm Beach, Fla.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 904,850

[22] Filed: May 11, 1978

[51] Int. Cl.: P02G 3/00

[52] U.S. Cl.: 60/261, 60/39.72 R

[58] Field of Search: 60/261, 39.72 R

[56] References Cited

U.S. PATENT DOCUMENTS

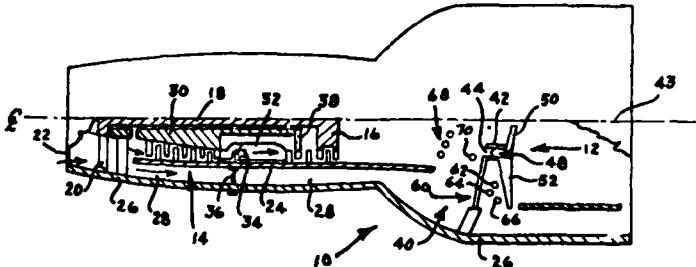
3,002,352	10/1961	Helfrich	.....	60/39.72 R
3,085,401	4/1963	Lefebvre	.....	60/39.72 R
3,153,324	10/1964	Meyer	.....	60/261
3,170,294	2/1965	Meyer	.....	60/39.72 R
3,295,325	1/1967	Nelson	.....	60/261
3,485,045	12/1969	Riecke	.....	60/261
3,800,527	4/1974	Marshall	.....	60/39.72 R
3,931,707	1/1976	Vdovak	.....	60/261

Primary Examiner—Douglas Hart
Attorney, Agent, or Firm—Joseph E. Rusz; Jacob N. Erlich

[57] ABSTRACT

A turbofan augmentor flameholder having a hollow ring-like structure of annular configuration concentric with the center line of a turbine of a turbofan engine. The ring-like structure has protruding therefrom in the radial direction a first group of hollow gutters extending in a direction toward the center line of the turbine and a second group of hollow gutters extending from the ring-like structure in a direction away from the center line and toward the outer casing of the turbofan engine. The second group of gutters have a vee-shaped angular configurated portion in a direction toward the turbine. The angular configurated portion gradually increases in angle along the gutter in the radial direction as a direct function of its distance from the ring-like structure. Such a relationship provides optimum efficiency for the dispersion of hot exhaust gases from the turbine to the flameholder for gas turbine engine augmentation.

3 Claims, 4 Drawing Figures





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United States Patent [19]

Wilkinson

[11] 4,185,461
[45] Jan. 29, 1980

[54] TURBOJET ENGINE WITH COMBUSTOR BYPASS

[75] Inventor: David B. Wilkinson, Xenia, Ohio
[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 868,399
[22] Filed: Jan. 10, 1978
[51] Int. Cl.² F02K 3/10; F02K 1/02
[52] U.S. Cl. 60/261; 60/262;
60/19.23

[58] Field of Search 60/261, 262, 247, 284,
60/39.67, 39.21, 39.23, 39.37

[56] References Cited
U.S. PATENT DOCUMENTS

2,693,674	11/1954	Anzionaz et al.	60/262
2,946,185	7/1960	Bayer	60/362
3,045,425	7/1962	Schiffman	60/361
3,486,338	12/1969	Hausmann et al.	60/262

FOREIGN PATENT DOCUMENTS

925984	3/1955	Fed. Rep. of Germany	60/262
615277	1/1961	Italy	60/262

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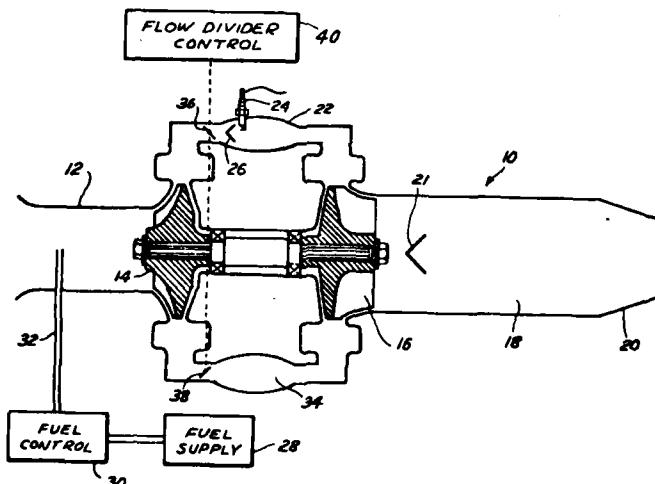
Hill et al., *Mechanics and Thermodynamics of Propulsion*,
1965, pp. 216-217.

Primary Examiner—Carlton R. Croyle
Assistant Examiner—Thomas I. Ross
Attorney, Agent, or Firm—Joseph E. Rusz; Richard J.
Killoren

[57] ABSTRACT

A propulsion system having an afterburning turbojet with the fuel supplied at the inlet to the turbojet compressor. The turbojet combustor has a bypass with a flow control connected at the inlets to the combustor and the bypass to control the amount of fuel-air mixture from the compressor that enters the combustor.

2 Claims, 1 Drawing Figure



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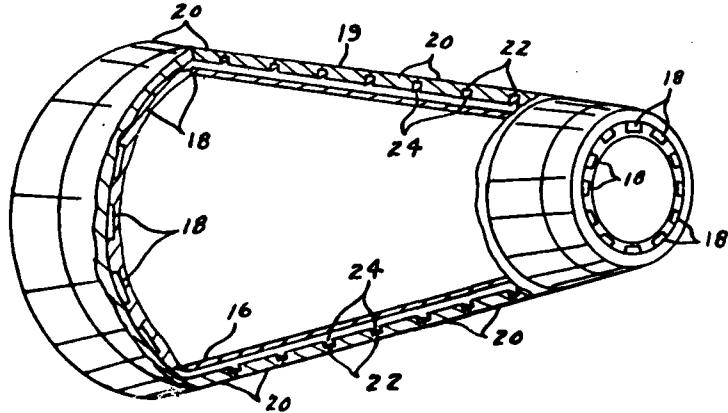
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United States Patent [19] [11] 4,185,558
Quinville [45] Jan. 29, 1980

[54] RE-ENTRY VEHICLE BOUNDARY LAYER
TRANSITION SUPPRESSOR [56] References Cited
[75] Inventor James A. Quinville, Redlands, Calif. U.S. PATENT DOCUMENTS
3,129,667 4/1964 Wen 102/105
[73] Assignee The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C. Primary Examiner—Verlin R. Pendegram
Attorney, Agent, or Firm—Joseph E. Rusz, Richard J.
Kiloren
[21] Appl. No. 725,582 [57] ABSTRACT
[22] Filed Apr. 23, 1988 Boundary layer transition is delayed on a re-entry vehicle by making use of the differential pressure that normally exists between the surface of a re-entry vehicle and the base region of the vehicle. Choked flow orifices are provided on the surface of the vehicle at the input to the internal ducting leading to the base region of the vehicle.
[51] Int. CL² B64C 1/30
[52] U.S. Cl. 102/105; 244/160
[58] Field of Search 102/105; 244/117.1,
244/123, 160 1 Claim, 6 Drawing Figures



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JAT 00172

R&D RECORD (Patent Abstract)

AFSC Address AFSC Md 1978



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United States Patent [19]

Peach

[11] 4,185,858

[45] Jan. 29, 1980

[54] SECONDARY SEAL FOR TUBING JOINED
VIA V-BAND COUPLINGS

3,762,746 10/1973 Amada 285/367 X

3,822,075 7/1974 Duncan 285/367

[75] Inventor: Douglas E. Peach, Enon Claw,
Wash.

2638018 3/1977 Fed. Rep. of Germany .. 285/DIG. 18

Primary Examiner—Thomas F. Callaghan
Attorney, Agent, or Firm—Joseph E. Rusz; James S.
Shannon; Casimer K. Salys

[21] Appl. No.: 920,867

[57] ABSTRACT

[22] Filed: Jun. 28, 1978

A device for sealing the joint between ducts having
sheet metal flanges mated with V-band couplings. Seal
assemblies are interposed between the V-band coupling
and the abutting duct flanges. As the V-band coupling is
tightened to draw the ends of the duct flanges together
the seal assembly is compressed, deforming the sealing
material in contact with the duct flanges and effectuating
a tight seal therebetween. A variety of seal assembly
configurations are contemplated including those of continuous
or segmented structure, those having compressible
resilient materials or ductile metals as sealing materials,
and those having a support band bonded to the
sealing material for added structural rigidity.

[31] Int. Cl. 1 F16L 23/04

2 Claims, 8 Drawing Figures

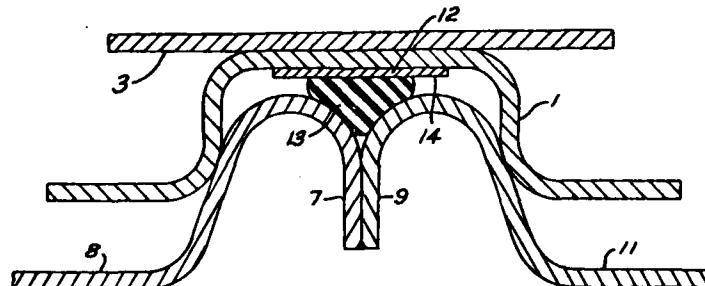
[52] U.S. Cl. 285/367; 277/236;
285/DIG. 18

[58] Field of Search .. 285/367, 366, 365, DIG. 18,
285/233, 234; 277/236

[56] References Cited

U.S. PATENT DOCUMENTS

1,863,122	6/1932	Matthews	285/367 X
2,090,137	8/1936	Walsh	285/367 X
3,499,587	11/1969	Rice	285/367
3,235,293	2/1966	Condon	285/367 X
3,464,722	9/1969	Larkus	285/367
3,563,571	2/1971	Werra	285/367 X



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United States Patent [19]

Williamson et al.

[11] 4,185,919
[45] Jan. 29, 1980

[54] QUADRANT DETECTION SYSTEM

[75] Inventors: Tommy L. Williamson; Kettering; Harold W. Rose, Xenia, both of Ohio

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 369,030

[22] Filed: Jun. 8, 1973

[51] Int. Cl.: G01B 11/26; G02B 5/18

[52] U.S. Cl.: 356/141; 350/3.72; 350/162 ZP; 356/152

[58] Field of Search: 356/141, 152, 350/3.5, 350/162 ZP, 3.72

[56] References Cited

U.S. PATENT DOCUMENTS

3,375,750 4/1968 Ellis et al. 356/152
3,701,402 10/1971 Bergin et al. 356/152

OTHER PUBLICATIONS

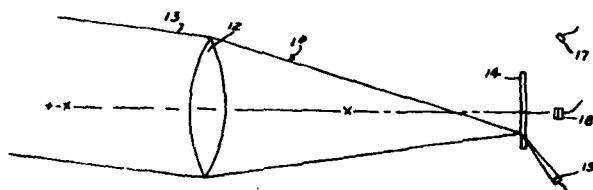
Sincerbox, IBM Tech. Discl. Bulletin, 8-1967, pp. 267, 268.

Primary Examiner—S. C. Buczinski
Attorney, Agent, or Firm—Joseph E. Rusz; Richard J. Killoren

[57] ABSTRACT

A quadrant detection system having an objective lens and a holographic lens positioned at the back focal plane of the objective lens. Four photoelectric detectors are positioned on the side of the holographic lens remote from the objective lens. The holographic lens has lens elements in four quadrants with each quadrant having a focal point corresponding to the position of the photoelectric detectors.

2 Claims, 5 Drawing Figures



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United States Patent [19]

Picklesimer et al.

[11] **4,187,359**
[45] **Feb. 5, 1980**

[54] **ACETYLENE-TERMINATED POLYIMIDE COMPOSITIONS**

[76] Inventors: **Lewellyn G. Picklesimer**, 3765 Winthrop Dr., Dayton, Ohio 45431; **Michael A. Lacarelli**, 175 Old Dayton Yellow Springs Rd., Fairborn, Ohio 45324; **Theodore J. Reinhart, Jr.**, 345 Forrer Blvd., Dayton, Ohio 45419

[21] Appl. No.: **967,049**

[22] Filed: **Dec. 6, 1978**

[51] Int. Cl. **2** C08L 77/10
[52] U.S. Cl. 525/6; 260/45.9 K;

260/45.9 KA; 528/125; 528/434

[58] Field of Search 526/6, 15, 52; 528/177, 528/178, 125; 260/45.9 K, 45.9 KA

[56] **References Cited**
U.S. PATENT DOCUMENTS

3,845,018 10/1974 Bilow et al. 528/178
3,864,309 2/1975 Bilow et al. 528/178
3,897,395 7/1975 D'Alelio 528/178
4,098,767 7/1978 Bilow 528/178

Primary Examiner—**Lester L. Lee**
Attorney, Agent, or Firm—**Joseph E. Rusz; Cedric H. Kuhn**

[57] **ABSTRACT**

A composition of matter comprising an acetylene-terminated polyimide oligomer and trinitroacetonitrile. The composition has a retarded cure rate, thereby facilitating the fabrication of void-free molded objects and composites.

3 Claims, No Drawings

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United States Patent [19]

Midolo

[11] 4,187,692
[45] Feb. 12, 1980

[54] LIQUID COOLED ROTARY VANE AIR CYCLE MACHINE

[76] Inventor: Lawrence L. Midolo, 1475 Black Oak Dr., Centerville, Ohio 45459

[21] Appl. No.: 902,524

[22] Filed: May 3, 1978

[51] Int. Cl.² F25D 9/00

[52] U.S. Cl. 62/402; 123/119 CD;

418/85

[58] Field of Search 62/86, 402, 499, 505; 418/83, 85, 86; 123/119 CD

[56] References Cited

U.S. PATENT DOCUMENTS

3,424,135	1/1969	Tado	418/86
3,884,664	5/1975	Edwards	62/402
4,117,695	10/1978	Hargreaves	62/86

Primary Examiner—Ronald C. Capossela

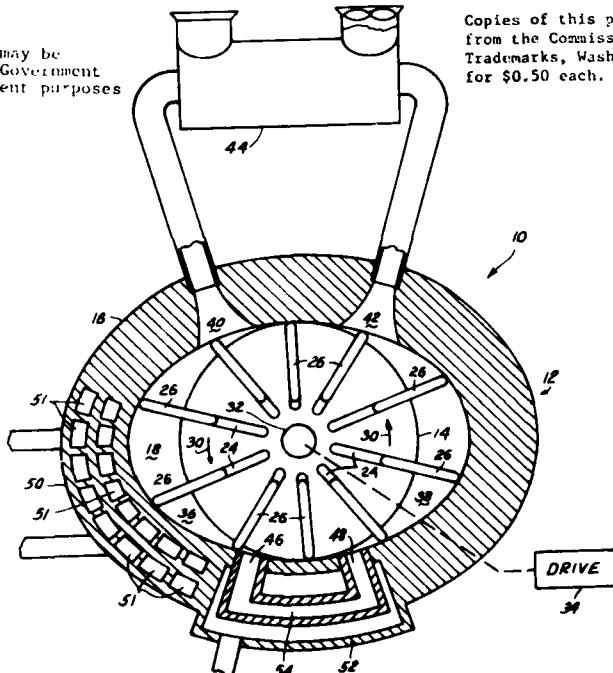
Attorney, Agent, or Firm—Joseph E. Rusz; Richard J. Killoren

[57] ABSTRACT

An air cooling system having a rotary assembly within a non-circular chamber wherein compression and expansion used in a modified reverse Brayton cycle are provided within the same chamber by the change in volume brought about by vanes sliding within slots in the rotor. Air is supplied to the compressor portion of the chamber from an air-to-air heat exchanger which receives cooled air from the expander. A transfer passage is provided between the output of the compressor and the inlet of the expander. A liquid cooled heat exchanger is provided adjacent the compressor. A second liquid cooled heat exchanger is provided around the transfer passage. Coolant is supplied to the liquid cooled heat exchangers from a radiator.

1 Claim, 4 Drawing Figures

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United States Patent [19]

Smolinski

[11] 4,187,693
[43] Feb. 12, 1980

[54] CLOSED CHAMBER ROTARY VANE GAS CYCLE COOLING SYSTEM

[76] Inventor: Ronald E. Smolinski, 4081 Forest Ridge, Dayton, Ohio 45424

[21] Appl. No.: 915,707

[22] Filed: Jun. 15, 1978

[51] Int. Cl.² F25D 9/00

[52] U.S. Cl. 62/402; 418/85;

123/119 CD Attorney, Agent, or Firm—Joseph E. Rusz; Richard J. Killoren

[53] Field of Search 62/402, 499, 86;
418/85, 86; 123/119 CD

[56] References Cited

U.S. PATENT DOCUMENTS

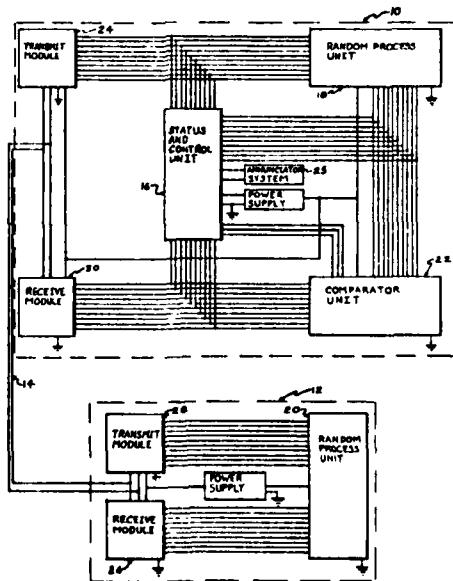
3,666,893	8/1972	Edwards	62/402
4,021,163	5/1977	Monte et al.	418/83
4,117,693	10/1978	Hargreaves	62/499

[57] ABSTRACT

A gas cycle cooling system having a rotary compressor and expander driven by a common shaft wherein the compression and expansion of a modified reverse Brayton cycle is provided within a closed chamber by changes in volume brought about by vanes sliding within slots in a rotor. The rotor is positioned within the chamber to provide spaces between the rotor and the chamber wall which act as effective gas transfer passages between the compressor and the expander. Liquid from a first heat exchanger is circulated through the wall of the rotor housing adjacent the compressor portion of the chamber to remove heat during the compressor phase of the cycle. Liquid is circulated through the wall of the rotor housing adjacent the expander portion of the chamber to provide cooling for a second heat exchanger.

Primary Examiner—Ronald C. Caposela

5 Claims, 2 Drawing Figures



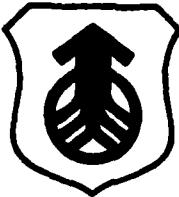
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United States Patent [19]

Midolo

[11] 4,187,694
[45] Feb. 12, 1980

- [54] **BINARY WORKING FLUID AIR CONDITIONING SYSTEM**
- [76] Inventor: Lawrence L. Midolo, 1475 Black Oak Dr., Centerville, Ohio 45459
- [21] Appl. No.: 962,742
- [22] Filed: Nov. 21, 1978
- [51] Int. Cl.²: F25D 9/00
- [52] U.S. Cl.: 62/402; 62/323; 123/119 CD; 60/618
- [58] Field of Search: 62/402, 323; 123/119 CD; 60/618
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Primary Examiner—Ronald C. Capossela
Attorney, Agent, or Firm—Joseph E. Rusz; Richard J. Killoren

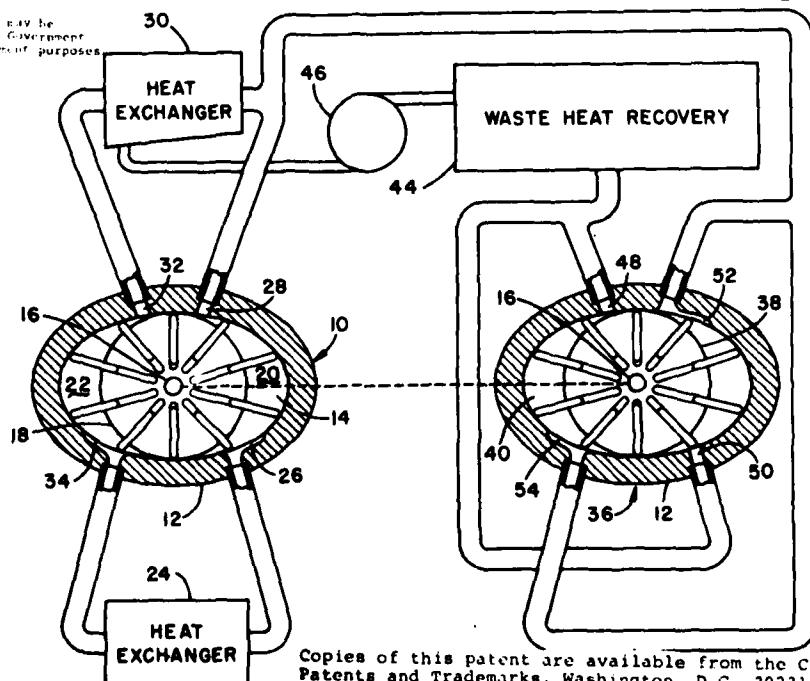
[57] ABSTRACT

An air conditioning system for vehicles having a reverse Brayton cycle cooling system with a turbine drive for the rotor in the reverse Brayton cycle cooling system. A binary working fluid is used in the air conditioning system with air used in the reverse Brayton cycle cooling system. Waste heat is used to provide superheated water vapor for driving the turbine with the turbine return supplied to the air flow at the outlet of the compressor of the cooling system. The combined working fluid is supplied to a heat rejection heat exchanger where the excess water vapor is condensed and returned to the waste heat recovery system.

9 Claims, 4 Drawing Figures

RIGHTS OF THE GOVERNMENT

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United States Patent [19]

Siegman et al.

[11] **4,188,591**
[45] **Feb. 12, 1980**

- [54] **RF EXCITED MERCURY LASER LAMP**
- [75] Inventors: Anthony E. Siegman; Neil C. Holmes, both of Stanford; Max T. Artusy, Mt. View, all of Calif.
- [73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
- [21] Appl. No.: 840,353
- [22] Filed: Oct. 7, 1977
- [51] Int. Cl.² H01S 3/092
- [52] U.S. Cl. 331/94.5 P; 313/220
- [58] Field of Search 331/94.5 P, 94.5 D, 331/94.5 G, 94.5 R; 313/220

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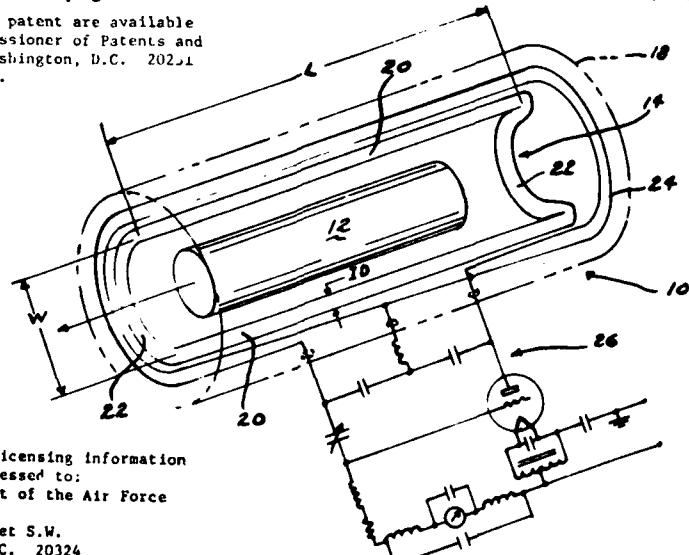
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**Primary Examiner—James W. Davie
Attorney, Agent, or Firm—Joseph E. Rusz; Jacob N. Erlich**

[57] **ABSTRACT**

An optically pumped laser wherein the optical pumping means is in the form of a mercury discharge lamp and a radio-frequency excited coil surrounding the lamp. The discharge lamp is constructed in the form of a closed loop and is inductively excited by the high power radio-frequency coil. The coil forms the primary coil and the lamp the secondary coil of an air-core transformer. Current in the lamp is excited entirely by the radio frequency magnetic fields passing through the plane of the lamp thereby optically pumping the lasing medium.

6 Claims, 3 Drawing Figures



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JAT 00179



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United States Patent [19]

Miller

[11] 4,189,203
[45] Feb. 19, 1980

[54] CIRCULAR CONNECTOR

[75] Inventor John W. Miller, Smyrna, Ga.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 927,434

[22] Filed: Jul. 24, 1971

[51] Int. Cl.² G01B 7/12; G01B 7/28;
H01R 13/04

HO1R 13/64

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"Dimensional Evaluation of Tapered Fastener Systems," Interim Technical Report, Lockheed-Georgia Co., Mar. 1977.

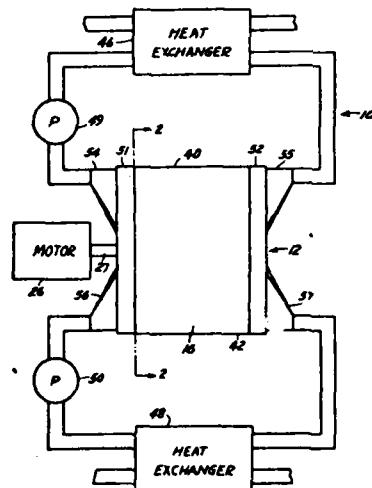
**Primary Examiner—Eugene F. Desmond
Attorney, Agent, or Firm—Joseph E. Rusz; Casimer K.
Salys**

[57] ABSTRACT

A high contact density circular connector capable of receiving and holding a multi-element

probe tip used to test the quality of tapered fastener holes. The outer surface of the probe tip has a multiplicity of conductive segments, which are covered by a thin layer of insulation at the end to be inserted into the holes being inspected. When the probe tip is inserted into a hole, capacitors are formed between the conductive segments on the probe tip and the metallic walls of the hole, which can be measured for value and correlated in a computer to disclose hole characteristics such as size, shape, and smoothness. The circular connector is the means by which probe measurements are transferred from the tip into a coaxial cable, for transmission to the electronic processor without molesting the minute capacitance measurements. The connector receives the probe tip, and by means of a key, indexes the angular orientation of the cylindrically shaped probe tip to mate it with appropriate conductive segments on the probe tip within the connector clips within the body of the circular connector. With the probe tip in place, a compression ring encircling the connector is rotated to draw the connector body and contacts tightly about the probe tip, thereby insuring effective electrical mating and fixed retention of the probe tip in the connector.

1 Claim, 3 Drawing Figures



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JAT 00180

AFSC — Andrews AFB Md 1978



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United States Patent [19]

Stadnick et al.

[11] 4,189,527
[45] Feb. 19, 1980

[54] SPHERICAL HEAT PIPE
METAL-HYDROGEN CELL

[75] Inventors: Steven J. Stadnick, Redondo Beach;
Howard H. Rogers, Culver City, both
of Calif.

[73] Assignee: The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.

[21] Appl. No.: 4,244

[22] Filed: Jan. 17, 1979

[51] Int. Cl.² H01M 12/06

[52] U.S. Cl. 429/26; 429/27;

429/101; 429/120

[58] Field of Search 429/26, 27, 101, 120;
165/32, 58, 132, 177

[56] References Cited

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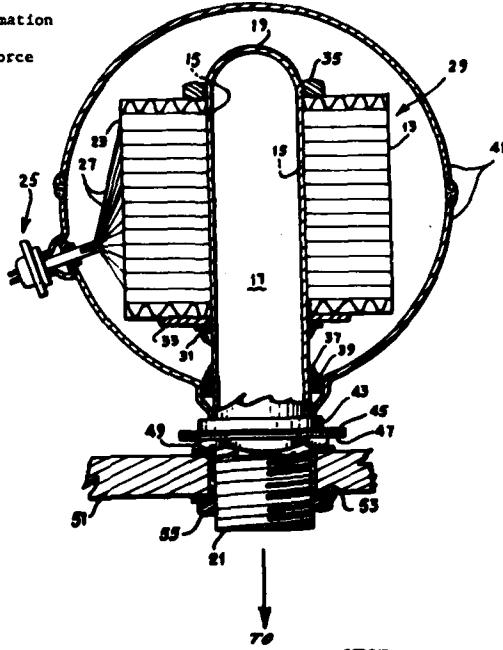
Primary Examiner—Anthony Skapars
Attorney, Agent, or Firm—Joseph E. Rusz; Arsen
Tashjian

[57] ABSTRACT

A metal-hydrogen cell (e.g., silver-hydrogen or nickel-hydrogen) of heat pipe design wherein a central heat pipe serves as a thermal path, a positive plate conductor and terminal, and a mechanical support for the stack. The positive plates are electrically, mechanically and thermally connected to the heat pipe in the stack center. The negative plate terminals are at the outside edge of the stack. The pressure vessel may be of spherical configuration to provide a light weight design which has a two to one stress advantage in hoop stress over a cylinder with the same wall thickness and internal pressure.

5 Claims, 1 Drawing Figure

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United States Patent [19]

Van Workum

[11] 4,190,814

[45] Feb. 26, 1980

[54] SINGLE AXIS RESONATOR FOR LASER

[75] Inventor: John A. Van Workum, Albuquerque,
N. Mex.

[73] Assignee: The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.

[21] Appl. No.: 882,525

[22] Filed: Mar. 1, 1978

[51] Int. Cl.² H01S 3/081

[52] U.S. Cl. 331/94.5 C; 350/294

[58] Field of Search 331/94.5 C, 94.5 D;
350/294, 299, 293

[56] References Cited

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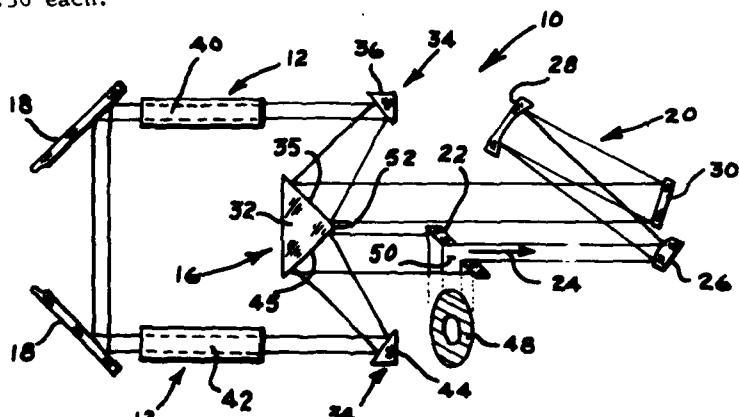
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12, No. 8 (Aug. 1973) pp. 1940-1944.

Primary Examiner—William L. Sikes
Attorney, Agent, or Firm—Joseph E. Rusz; Jacob N.
Erlich

[57] ABSTRACT

A single axis resonator for use within a laser having an annular gain region. The single axis resonator extracts optical power from the annular gain region by the use of a beam expander, reflaxicon, corner cube and output coupler, wherein the optical axis of the resonator passes through the center of the output coupler. The reflaxicon transforms a substantially elliptically-shaped beam into a crescent-shaped beam which closely resembles the shape of a section of the annular gain region. The crescent-shaped beam is reflected through the gain region several times to build up energy before being translated back into its original shape for reflection out of the laser by the output coupler.

8 Claims, 2 Drawing Figures



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R&D RECORD (Patent Abstract)

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United States Patent [19]

Albanese

4,190,815

Feb. 26, 1980

[54] **HIGH POWER HYBRID SWITCH**

[75] **Inventor:** Victor J. Albanese, Valley Stream, N.Y.

[73] **Assignee:** The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] **Appl. No.:** 884,882

[22] **Filed:** Mar. 9, 1978

[51] **Int. Cl.:** H01P 1/12

[52] **U.S. Cl.:** 333/101; 333/109;

333/111

[58] **Field of Search:** 333/7 R, 10, 101, 109, 333/111, 113, 114, 115, 116

[56] **References Cited**

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Primary Examiner—Eugene R. LaRoche

Assistant Examiner—Robert E. Wise

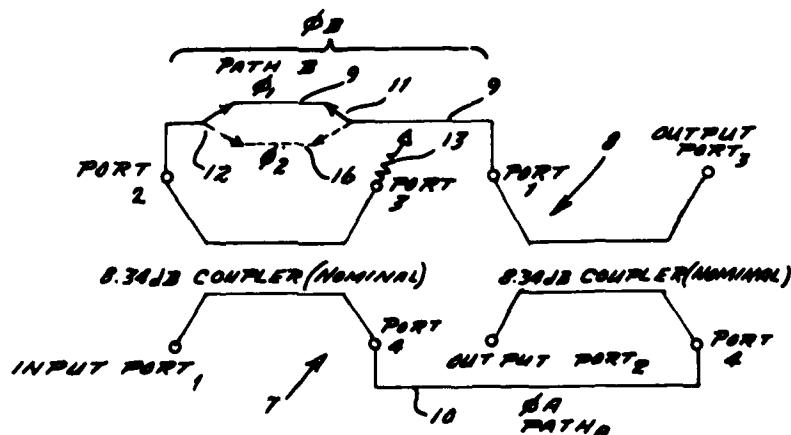
Attorney, Agent, or Firm—Joseph E. Rusz; Willard R. Matthews, Jr.

[57] **ABSTRACT**

High levels of R.F. power are controlled and switched by means of a hybrid switching network that employs an intermediate power level switch matrix in conjunction with a pair of 8.34 (nominal) directional couplers and a phasing network. The two directional couplers are connected in tandem by two equal length transmission lines to form a broadband quadrature 3dB hybrid. Switching is accomplished by selectively inserting a 180° phase shift means into the lower power carrying transmission line. The phase shifting means can be a length of transmission line, a solid state device, or a Schiffman type phase shifter.

8 Claims, 6 Drawing Figures

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United States Patent [19]

Cross et al.

[11] **4,190,858**

[45] **Feb. 26, 1980**

[54] **METHOD FOR IMPROVED PERFORMANCE OF INFRARED VIDICON CAMERAS**

[75] Inventors: **Edward F. Cross, Los Angeles; Wilbur A. Garber, San Pedro, both of Calif.**

[73] Assignee: **The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

[21] Appl. No.: **946,263**

[22] Filed: **Sep. 27, 1978**

[51] Int. Cl.² **H04N 5/33**

[52] U.S. Cl. **358/113; 358/217**

[58] Field of Search **358/113, 217; 250/333,**

250/351

[56] **References Cited**

U.S. PATENT DOCUMENTS

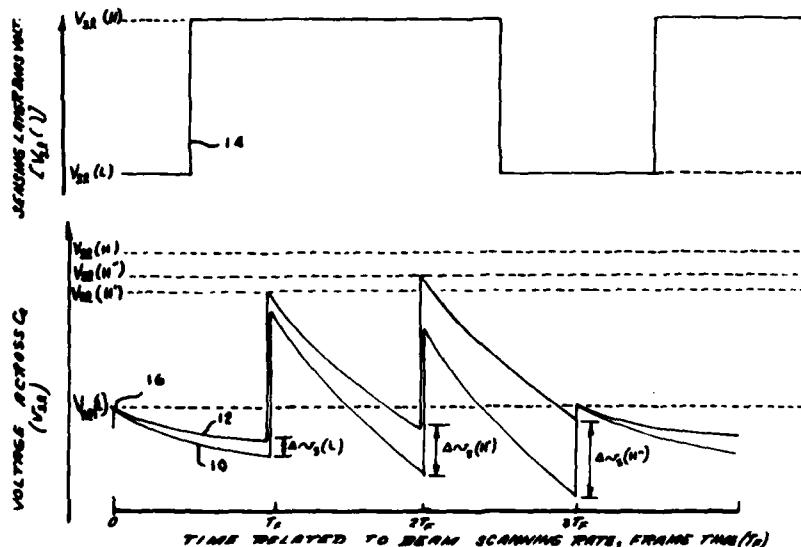
3,646,267 2/1972 Tompsett 358/113
4,100,574 7/1978 Felix 358/113

**Primary Examiner—Richard Murray
Attorney, Agent, or Firm—Joseph E. Rusz; Henry S. Miller**

[57] **ABSTRACT**

Infra red (IR) vidicon camera tube performance is improved by alternately switching the sensing layer voltage to one of two values in synchronism with the frame rate of an IR TV camera. In operation the sensing layer is switched to a high voltage for two frames and then switched to the normal voltage for one frame readout. Camera tube response is in real time, thereby eliminating need for change in scanning beam rate or subsequent data processing of recorded video data.

1 Claim, 5 Drawing Figures



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United States Patent [19]

Quinlan et al.

[11] **4,191,561**

[45] Mar. 4, 1980

[54] **METHOD FOR THE PRODUCTION OF TRIALUMINUM NICKELIDE FIBERS**

[75] Inventors: Kenneth P. Quinlan, Newton; Joseph J. Hutta, Groton, both of Mass.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 968,874

[22] Filed: Dec. 12, 1978

[51] Int. Cl.² C23F 1/02

[52] U.S. Cl. 75/101 R; 252/79.4;

423/132; 428/611; 75/138

[58] Field of Search 75/101 R, 101 BE, 104, 75/111, 114, 121, 138; 428/611; 156/665, 656; 252/79.4; 423/132, DIG. 14

[56] **References Cited**

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Primary Examiner—L. Dewayne Rutledge

Assistant Examiner—Michael L. Lewis

Attorney, Agent, or Firm—Joseph E. Rusz; William J. O'Brien

[57] **ABSTRACT**

A process for the production of trialuminum nickelide fibers which involves the utilization of an oxalic acid-hydrogen chloride mixture for separating the fibers from a solid, two-phase, composite matrix of aluminum and trialuminum nickelide fibers.

2 Claims, No Drawings

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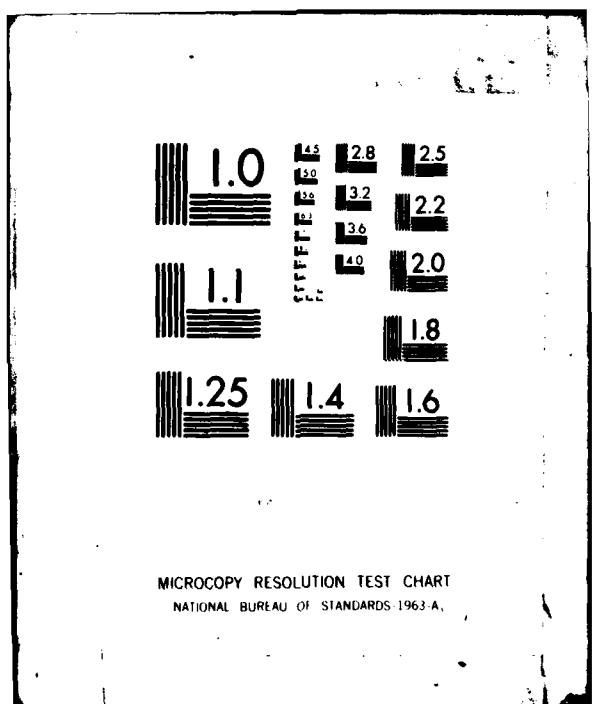
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United States Patent [19]

Jacomini

[11] 4,192,235
[45] Mar. 11, 1980

- [54] RADIANT-ENERGY CONTROLLED PROXIMITY FUZE
- [75] Inventor: Omar J. Jacomini, Severna Park, Md.
- [73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
- [21] Appl. No.: 381,272
- [22] Filed: Jul. 8, 1964
- [51] Int. Cl.² F42C 13/04
- [52] U.S. Cl. 102/214
- [58] Field of Search 102/70.2 P, 214; 343/7 PF

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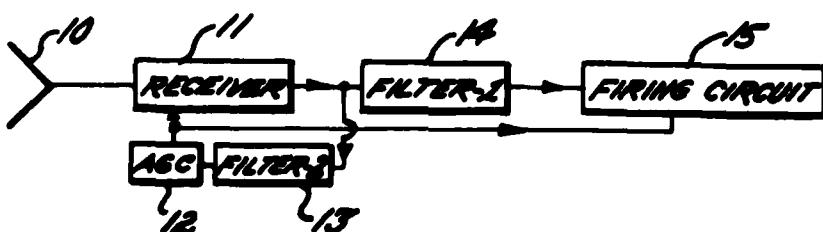
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Primary Examiner—Charles T. Jordan
Attorney, Agent or Firm—Joseph E. Rusz; Cedric H. Kuhn

EXEMPLARY CLAIM

1. A receiver for the transmitter-receiver combination

1 Claim, 4 Drawing Figures



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AFSC — Andrew AFB MD 1970



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United States Patent [19]

[11] 4,192,302

[45] Mar. 11, 1980

- [54] **HEPATIC ISOLATION AND PERFUSION CIRCUIT ASSEMBLY**

[76] Inventor: Arthur W. Boddie, 110 Chimney Rock, San Antonio, Tex. 78231

[21] Appl. No.: 941,715

[22] Filed: Sep. 12, 1978

[51] Int. Cl.² E03D 9/04

[52] U.S. Cl. 128/214 R; 128/214 B;
128/1 R; 128/DIG. 3

[58] Field of Search 128/214 R, 214 B, DIG. 3;
128/1 R; 422/45; 210/32B

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| 3,881,483 | 5/1975 | Sausse | 128/214 R |
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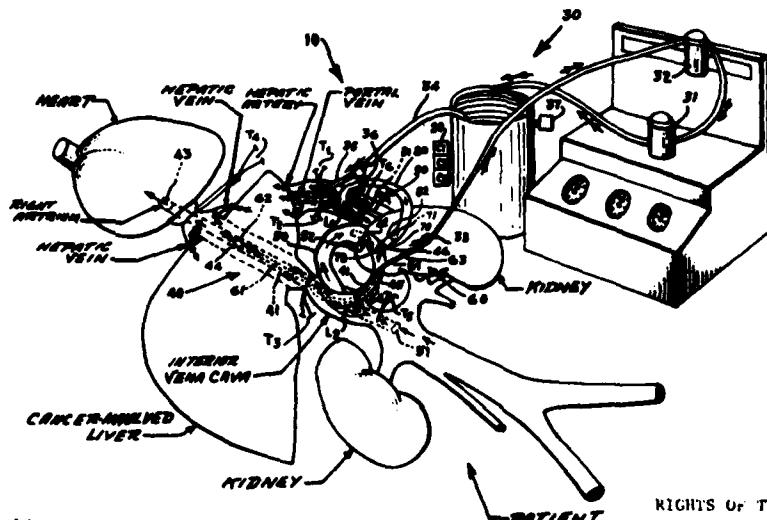
Article—"A Technique of Isolated Perfusion of the Liver", Chung, et al. *Surgery*, 1962, vol. 51, No. 4, pp. 508-511.

Primary Examiner—Henry K. Artis
Attorney, Agent, or Firm—Joseph E. Rusz; Arsen Tashjian

[57] ABSTRACT

The assembly, through a plurality of shunts, allows blood circulation from the lower part of a patient's body and from the intestines to flow unimpeded to the heart, while isolating hepatic venous blood containing toxic agents from the general circulation and returning it to a heart-lung machine. As a result, the assembly can be used to perfuse the liver, of a patient which has become involved with cancer, with extremely high doses of cancercidal chemotherapy agents, while at the same time avoiding the toxic effects of these agents on the patient's body as a whole.

5 Claims, 3 Drawing Figures



RIGHTS OF THE GOVERNMENT

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AFSC FORM SEP 78 79c

R&D RECORD (Patent Abstract)

JAT 00187

AFSC — Andover AFM 1970



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United States Patent [19]

Prucha et al.

[11] **4,192,967**

[45] Mar. 11, 1980

[54] TELETYPE MIXER APPARATUS FOR
CODING AND DECODING

[56] References Cited
U.S. PATENT DOCUMENTS

[75] Inventors: Martin J. Prucha, Mountain View, Calif.; Willis L. Donaldson; Douglas N. Travers, both of San Antonio, Tex.

2,401,855	6/1946	Briggs et al.	178/22
2,872,514	2/1959	Negri	178/22
3,229,037	1/1966	Schrager et al.	178/22
3,291,908	12/1966	Ehrst	178/22

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Primary Examiner—Howard A. Birmiel
Attorney, Agent, or Firm—Joseph E. Ruiz; George Fine

[21] Appl. No.: 534,286

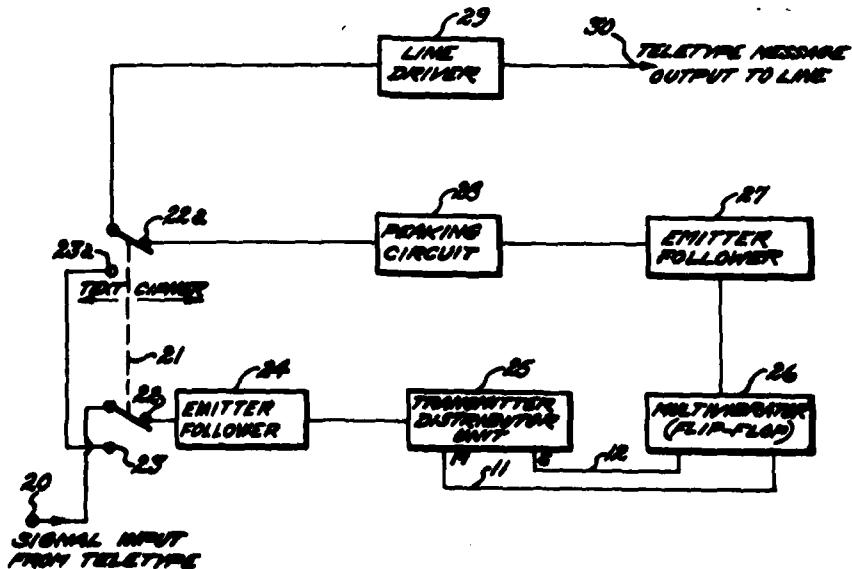
[57] ABSTRACT

[22] Filed: May 26, 1966

Apparatus for terminating teletype signal lines and mixing cryptographic teletype signals to furnish an enciphered teletype signal including a secondary operating mode of the mixer unit to retransmit the incoming teletype signal in the event enciphering or deciphering is not required.

[51] Int. Cl.² H04L 9/02
[52] U.S. Cl. 178/22
[58] Field of Search 178/22

4 Claims, 5 Drawing Figures



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JAT 00188



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United States Patent [19]

[11] 4,193,032
[45] Mar. 11, 1980

[54] HIGH SPEED TRANSMITTER PULSER
[75] Inventors: Walter E. Milberger, Severna Park;
Larry G. Wright, Pasadena, both of
Md.
[73] Assignee: The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.
[21] Appl. No.: 826,057
[22] Filed: May 8, 1969
[51] Int. Cl. 2 G01S 7/36
[52] U.S. Cl. 178/116; 375/68;
343/18 E
[58] Field of Search 343/18 E; 325/104, 120,
325/132, 150, 169

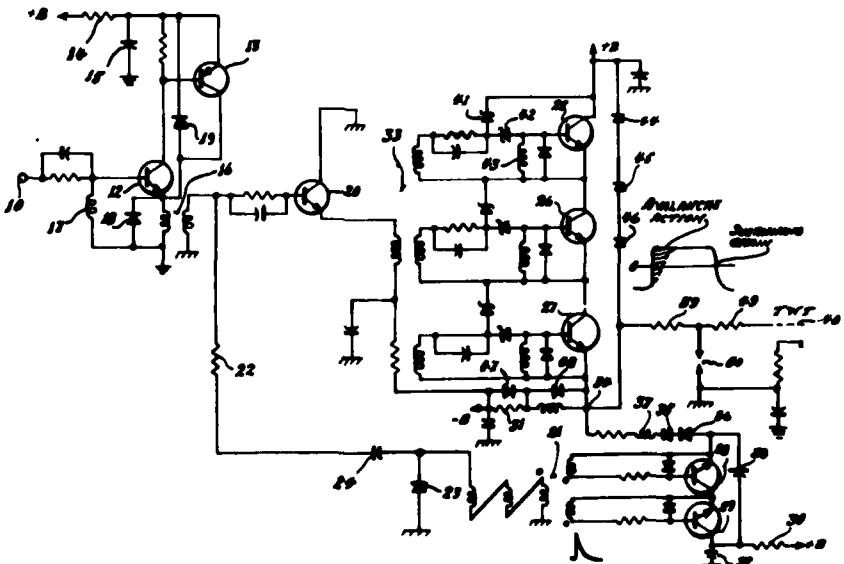
[56] References Cited
U.S. PATENT DOCUMENTS
3,891,969 6/1975 Barney et al. 343/18 E
3,909,828 9/1975 Israel et al. 343/18 E
4,037,227 7/1977 Kline 343/18 E

Primary Examiner—T. H. Tubbesing
Attorney, Agent, or Firm—Joseph E. Ruiz; George Fine

[57] ABSTRACT

An apparatus for pulsing a high speed transmitter having pulser delay times in the nanosecond range. The combination of solid state and spark gap devices provide protection against high voltage arcs for both transient and power follow-through conditions.

6 Claims, 1 Drawing Figure





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United States Patent [19]

Carter et al.

[11] 4,193,047
[45] Mar. 11, 1980

[54] FREQUENCY SELECTIVE
FERRIMAGNETIC POWER LIMITER

[73] Inventors: Philip S. Carter, Palo Alto, Calif.; Steven N. Stitzer, Ellicott City; Harry Goldie, Randallstown, both of Md.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 902,130

[22] Filed: May 2, 1978

[51] Int. Cl. H01P 1/22
[52] U.S. Cl. 333/17 L; 333/24.2;
333/222

[58] Field of Search 333/17 L, 24.2, 73 S,
333/204, 205

[56] References Cited

U.S. PATENT DOCUMENTS

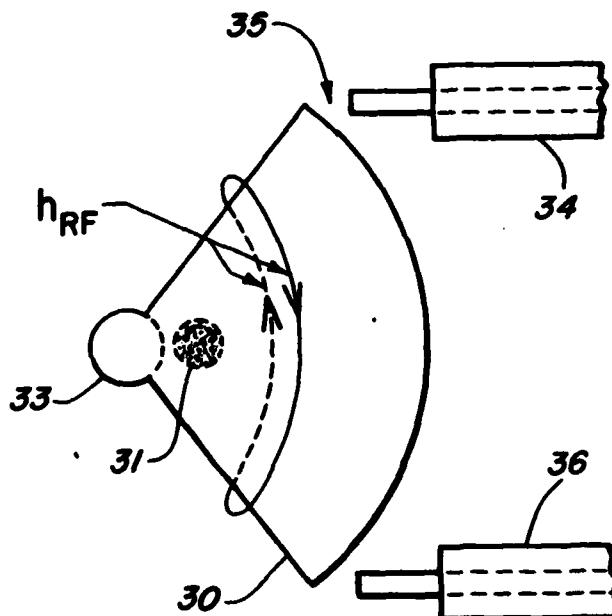
3,113,278 12/1963 Okwit 333/24.2
4,146,896 3/1979 Baril et al. 333/204 X

Primary Examiner—Paul L. Gensler
Attorney, Agent, or Firm—Joseph E. Rusz; Robert Kern
Duncan

[57] ABSTRACT

Two sectoral radial resonators coupled at their centers of radii by a strip transmission line and doubly loaded with opposing ferrimagnetic spheres between the said strip transmission line and the ground planes provides a frequency selective power limiter.

1 Claim, 10 Drawing Figures



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JAT 00190

AFSC — Andrew AFSC 1978



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United States Patent [19]

Harris

[11] **4,193,059**
[45] Mar. 11, 1980

[54] ATTITUDE INDICATOR COMPARATOR
WARNING SYSTEM

2,794,975	6/1957	Sedgfield et al.	340/198
2,810,119	10/1957	Brown	340/27 NA
2,950,460	8/1960	Seifried et al.	340/27 R
3,094,691	6/1963	Trofeska	340/181
3,534,349	10/1970	Mellino	340/198
3,537,086	10/1970	Andreas	340/27 R

[75] Inventor: Richard L. Harris, Oklahoma City, Okla.

Primary Examiner—John W. Caldwell, Sr.

Assistant Examiner—James J. Groody

Attorney, Agent, or Firm—Joseph E. Rust; Robert Kern Duncan

[21] Appl. No.: 915,768

[57] ABSTRACT

[22] Filed: Jun. 15, 1978

The indications of attitude indicators at two different indicating locations that are indicating the same parameter but actuated from different sources, are monitored for the same indication by electrically interconnecting two transolvers that are mechanically coupled to the respective attitude indicator at each location. A monitor, at one indicating location, furnishes the excitation for the transolver at the other location and by the magnitudes of the sine and cosine outputs of the local transolver furnishes flag indication of any system defects of either indicator at each location.

[51] Int. Cl.² G08B 21/00; G08C 19/46

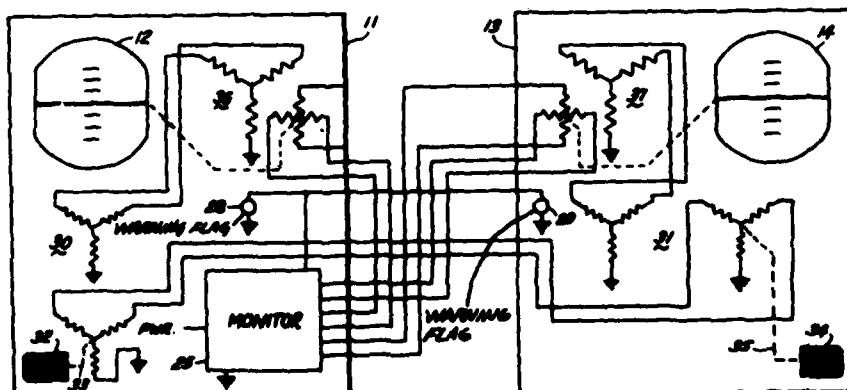
[52] U.S. Cl. 340/27 AT; 33/328;
340/27 R; 340/181; 340/198; 340/315;
340/681; 318/654

[58] Field of Search 340/27 R, 27 NA, 27 AT,
340/181, 198, 315, 681; 33/328, 329, 330;
318/654; 244/177, 194, 196

[56] References Cited
U.S. PATENT DOCUMENTS

2,428,402	10/1947	Winterbottom	340/315
2,432,772	12/1947	Lear	340/315
2,596,698	5/1952	Laine et al.	340/198

4 Claims, 3 Drawing Figures



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United States Patent [19]

Zoltai

[11] **4,193,061**

[45] Mar. 11, 1980

[54] ELECTRONIC AUTHENTICATION SYSTEM

[76] Inventor: John T. Zoltai, P.O. Box 5463, Santa Fe, N. Mex. 87502

[21] Appl. No.: 923,749

[22] Filed: Jul. 11, 1978

[51] Int. Cl. ² H04Q 3/02

[52] U.S. Cl. 371/67; 235/382;
340/149 R

[58] Field of Search 340/146.1 C, 146.1 R,
340/146.1 E, 149 R, 149 A; 364/200, 900;
235/380, 382

[56] References Cited

U.S. PATENT DOCUMENTS

3,794,813 2/1974 Spetz 235/382

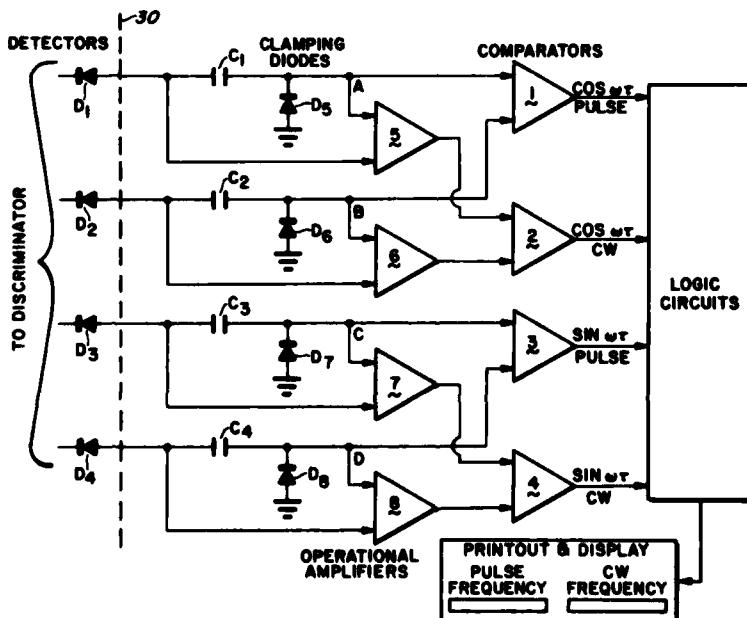
3,846,622 11/1974 Meyer 235/382
3,956,615 5/1976 Anderson et al. 340/149 A
4,016,404 4/1977 Appleton 235/380
4,017,835 4/1977 Randolph 235/380
4,114,027 9/1978 Slater et al. 340/149 A
4,142,097 2/1979 Ulch 340/149 R

Primary Examiner—Charles E. Atkinson
Attorney, Agent, or Firm—Joseph E. Rusz; William Stepanishen

[57] ABSTRACT

An electronic authentication system utilizing a predetermined random code to simultaneously interrogate the control unit and the remote unit by a comparison of the response of each unit.

7 Claims, 6 Drawing Figures



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JAT 00192

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R&D RECORD (Patent Abstract)



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United States Patent [19]

Morrison et al.

[11] 4,193,066
[45] Mar. 11, 1980

[54] AUTOMATIC BIAS ADJUSTMENT CIRCUIT
FOR A SUCCESSIVE RANGED
ANALOG/DIGITAL CONVERTER

[75] Inventors: Steven Morrison; Thomas K. Lisle,
Jr.; Clarence C. Glover, all of
Baltimore, Md.

[73] Assignee: The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.

[21] Appl. No.: 898,047

[22] Filed: Apr. 20, 1978

[51] Int. Cl.: H03K 13/02

[52] U.S. Cl.: 340/347 CC; 340/347 AD

[58] Field of Search: 340/347 AD, 347 CC,
340/347 M; 235/310

[56] References Cited

U.S. PATENT DOCUMENTS

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|-----------|--------|------------------|------------|
| 3,501,625 | 3/1970 | Gorbatenko | 235/310 |
| 3,646,586 | 2/1972 | Kurz | 340/347 AD |
| 3,754,232 | 8/1973 | Gut | 340/347 CC |

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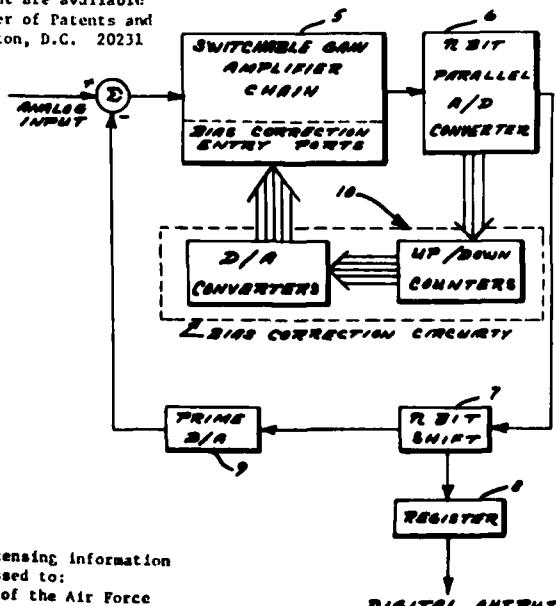
3,786,491 1/1974 Carleton 340/347 CC
3,889,255 6/1975 Pettersen 340/347 CC

Primary Examiner—Charles D. Miller
Attorney, Agent, or Firm—Joseph E. Rusz; Willard R.
Matthews, Jr.

[57] ABSTRACT

An automatic bias adjustment circuit for a successive ranged analog/digital converter (SRADC) that eliminates the need for manual bias adjustments and calibration inputs. The bias correction circuit comprehends dual flip flops that are triggered by selected comparators of the SRADC n bit parallel analog/digital converter. The flip flop output signals control up/down counters whose output bits drive digital/analog converter. The digital/analog converted signals are introduced back into the SRADC analog chain to zero bias errors in a particular sub-range. A disabling circuit prevents operation of the bias adjustment circuits for the first sub-range.

2 Claims, 3 Drawing Figures



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United States Patent [19]

Morrison et al.

[11] 4,194,186
[45] Mar. 18, 1980

[54] DIGITAL HYSTERESIS CIRCUIT

[75] Inventors: Steven Morrison; Thomas K. Liles,
Jr., both of Baltimore, Md.

[73] Assignee: The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.

[21] Appl. No.: 898,867

[22] Filed: Apr. 20, 1978

[51] Int. Cl.² H03K 13/02

[52] U.S. Cl. 340/347 AD; 340/347 CC

[58] Field of Search 340/347 AD, 347 CC;
235/92 PE

[56] References Cited

U.S. PATENT DOCUMENTS

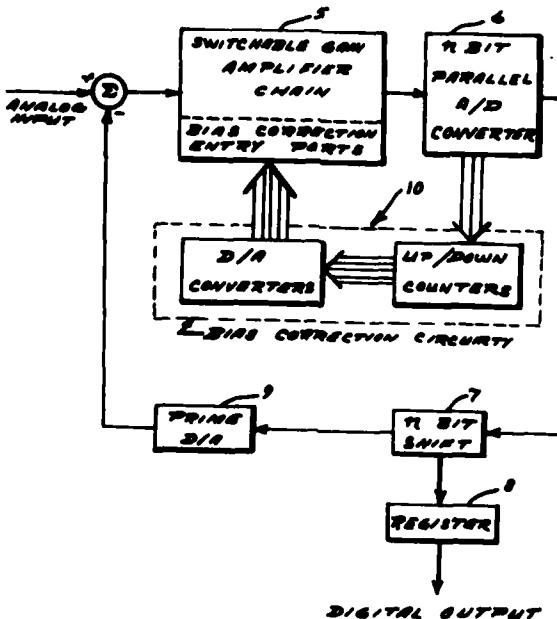
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|-----------|--------|----------|------------|
| 3,786,488 | 1/1974 | Ahlgren | 235/92 PE |
| 3,786,491 | 1/1974 | Carleton | 340/347 CC |
| 4,084,082 | 4/1978 | Alife | 235/92 PE |

Primary Examiner—Charles D. Miller
Attorney, Agent, or Firm—Joseph E. Rusz; Willard R.
Matthews, Jr.

[57] ABSTRACT

Noise induced hunting is eliminated in successive ranged digital/analog converter bias correction circuits by means of a digital hysteresis circuit. The digital hysteresis circuit comprehends a first up/down counter that counts to its extremes from a pre-set intermediate state in response to enable and up/down input signals. For each extremum count an enable output pulse and a reset pulse is generated at the counter output. The enable output pulses are counted by a second up/down counter the output of which drives a digital/analog converter. Each reset pulse resets the first up/down counter to its pre-set state.

2 Claims, 5 Drawing Figures



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United States Patent [19]

Goldie

[11] 4,194,200

[45] Mar. 18, 1980

[54] COMBINED RECEIVER PROTECTOR, AGC ATTENUATOR AND SENSITIVITY TIME CONTROL DEVICE

[75] Inventor: Harry Goldie, Randallstown, Md.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 956,704

[22] Filed: Nov. 1, 1978

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 801,714, May 31, 1977, abandoned.

[51] Int. Cl.³ G01S 7/34

[52] U.S. Cl. 343/5 SM; 343/7 AG;

333/13

[58] Field of Search 333/13; 343/5 SM, 7 AG

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Washington, D.C. 20324

[56] References Cited

U.S. PATENT DOCUMENTS

2,984,741	5/1961	Bronstein et al.	343/5 SM X
3,588,894	6/1971	Prickett	343/7 AG
3,725,913	4/1973	Roehl et al	343/5 SM
3,949,398	4/1976	Donahue	343/5 SM X
4,027,255	5/1977	Blakeney	333/13

Primary Examiner—T. H. Tubbesing

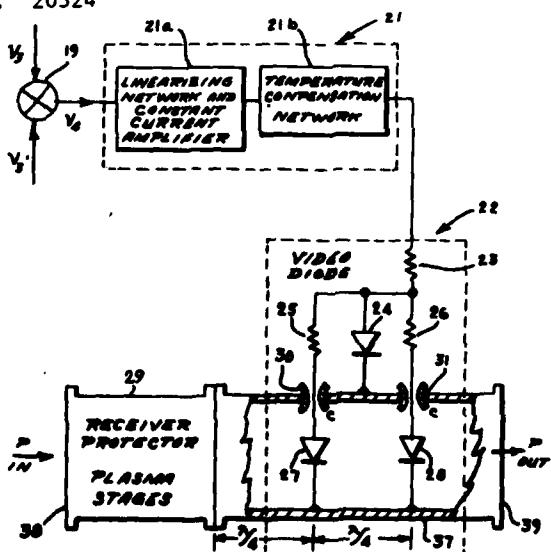
Attorney, Agent, or Firm—Joseph E. Rusz; Willard R. Matthews

[57] ABSTRACT

The passive receiver protector, AGC attenuator and sensitivity time control functions of a radar are combined in a single device which performs the functions in front of the radar low noise amplifier with relatively low loss. The receiver protector utilizes semiconductor diodes which operate as a power limiter during transmit and as precision attenuators during receive.

9 Claims, 6 Drawing Figures

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United States Patent [19]

Willmore et al.

[11] **4,194,205**

[45] Mar. 18, 1980

[54] **R.F. POWER AND VIDEO MODULATION MONITORING CIRCUIT FOR COUNTERMEASURES SYSTEM**

4,114,152 9/1978 Wiedemann 343/18 E X
4,121,214 10/1978 Marinaccio et al. 343/18 E
4,122,452 10/1978 Richmond 343/18 E

[75] Inventors: Robert R. Willmore, Millersville; William B. McCartney, Odenton, both of Md.

*Primary Examiner—Malcolm F. Hubler
Attorney, Agent, or Firm—Joseph E. Rusz; Willard R. Matthews*

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[57] **ABSTRACT**

The RF power and video modulation monitoring circuit of the invention provides the unique capability of monitoring the performance of a repeater/noise jammer countermeasures system when the system is operating in either the repeater or the noise jamming mode. In the repeater mode the system's noise level is measured in an unused portion of the countermeasures system frequency band to provide a monitor of system gain and antenna VSWR. In the noise mode crystal detection and threshold comparison provides an indication of RF power output. In either jamming mode the measurement of AC in the detected output provides a monitor of modulation.

[21] Appl. No.: 868,969

3 Claims, 2 Drawing Figures

[22] Filed: Jan. 6, 1978

[51] Int. Cl.² G01S 7/38; G01S 7/40;
H04K 3/00

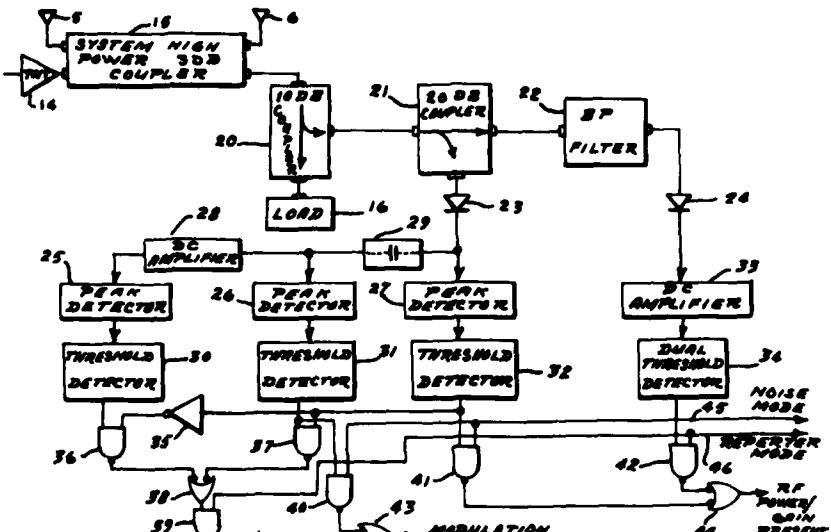
[52] U.S. Cl. 343/17.7; 343/18 E

[58] Field of Search 343/17.7, 18 E

[56] **References Cited**

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2,840,810 6/1958 Bailey, Jr. 343/17.7
3,543,270 11/1970 Wiley, Jr. 343/17.7 X
3,792,475 2/1974 Smetana 343/17.7



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United States Patent [19]

TSUI ET AL.

[11] **4,194,206**
[45] **Mar. 18, 1980**

[54] **INSTANTANEOUS FREQUENCY
MEASUREMENT (IFM) RECEIVER WITH
CAPABILITY TO SEPARATE CW AND
PULSED SIGNALS**

[75] Inventors: **James B. Y. Tsui, Centerville; Gerd H. Schrick, Dayton, both of Ohio**

[73] Assignee: **The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

[21] Appl. No.: **240**

[22] Filed: **Dec. 22, 1978**

[51] Int. Cl. **G01S 7/36**
[52] U.S. Cl. **343/18 E; 324/78 F**
[58] Field of Search **324/77 E, 78 F; 343/18 E**

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[56] **References Cited**

U.S. PATENT DOCUMENTS

3,922,676	11/1975	O'Berry et al.	343/18 E X
3,986,188	10/1976	True	343/18 E
4,025,920	5/1977	Reitboeck et al.	343/18 E X
4,146,892	3/1979	Overman et al.	343/18 E

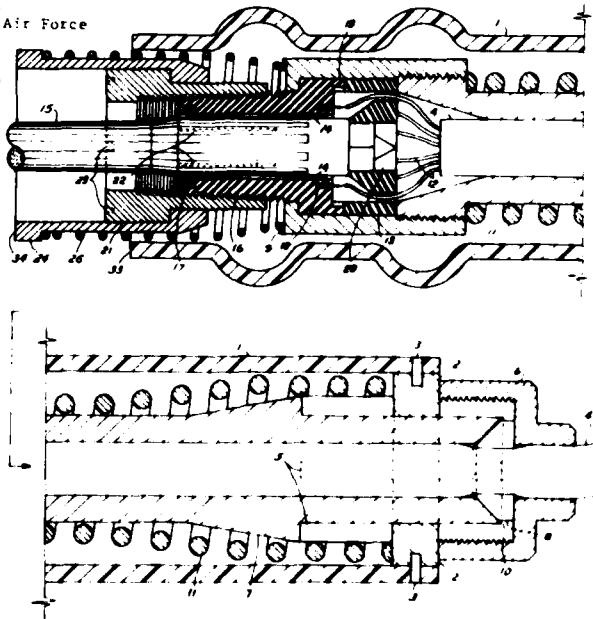
Primary Examiner—T. H. Tubbesing

Attorney, Agent, or Firm—Joseph E. Rusz; Robert Kern Duncan

[57] **ABSTRACT**

The video outputs of the correlators of a conventional IFM receiver are split by capacitors to obtain (1) pulse signals only and (2) pulse plus cw signals. Combining these signals in differential amplifiers, frequency readings are provided in the normal manner with the improvement that the individual frequency readings of simultaneously received pulse and cw signals are provided.

2 Claims, 2 Drawing Figures



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United States Patent [19]

Coulbourn, Jr.

[11] 4,194,209

[45] Mar. 18, 1980

[54] BROADBAND WAVEGUIDE LENS
ANTENNA AND METHOD OF
FABRICATION

[75] Inventor: Charles B. Coulbourn, Jr., Rolling
Hills Estates, Calif.

[73] Assignee: The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.

[21] Appl. No.: 866,187

[22] Filed: Dec. 30, 1977

[51] Int. Cl. 2 H01L 19/06

[52] U.S. Cl. 343/753; 343/910

[58] Field of Search 343/909-911 R,
343/753, 754, 756

2,736,894 2/1956 Kock 343/910

Primary Examiner—David K. Moore
Attorney, Agent, or Firm—Joseph E. Rusz; Willard R.
Matthews, Jr.

[57] ABSTRACT

Increased bandwidth in a waveguide lens antenna is achieved by altering the geometry of the stepped antenna guide plates in a manner that causes the net contribution of the antenna phase dispersion sources to result in zero average aperture phase error. Design equations are included for the fabrication of waveguide lens antenna having any desired degree of phase compensation. In principle, the plate geometry is configured to effect a given relationship between the components of phase error due to guide plate dispersion and the component of phase error due to the guide plate steps. When these components are equal and opposite zero average aperture phase error (maximum bandwidth operation) is achieved.

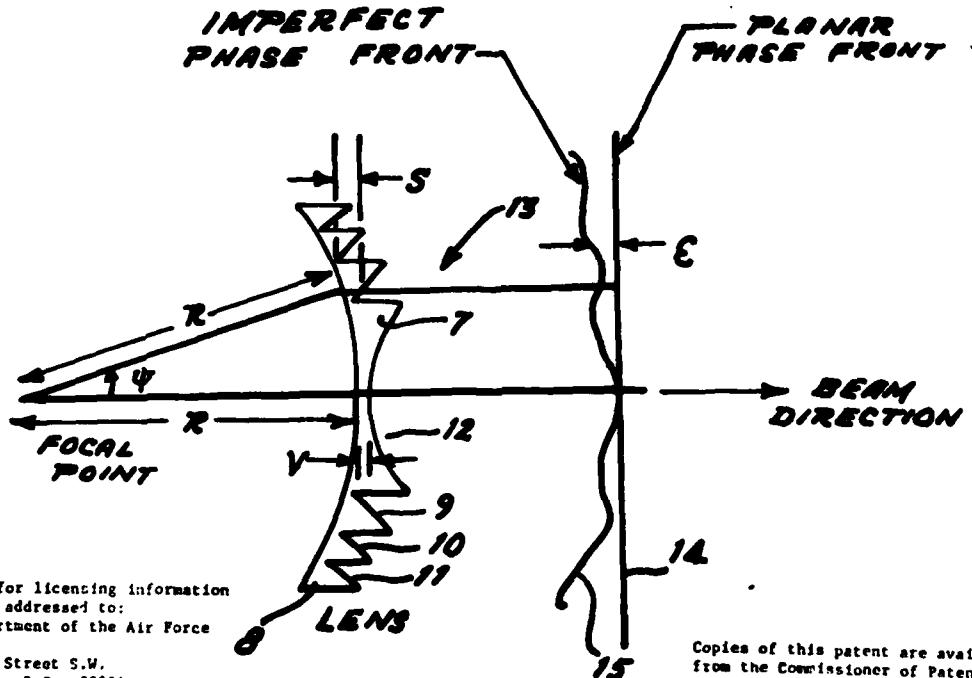
1 Claim, 13 Drawing Figures

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JAT 00198

AFSC — Andrews AFB MD 1970



PATENT
ABSTRACT

FROM THE AIR FORCE SYSTEMS COMMAND

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United States Patent [19]

Tracy et al.

[11] 4,194,708
[45] Mar. 25, 1980

[54] REMOTELY PILOTED VEHICLE

[75] Inventors: Daniel J. Tracy, Maple Valley; John P. Palmer, Seattle; Daniel J. O'Brien, Kirkland, all of Wash.

[73] Assignee: The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

[21] Appl. No.: 944,441

[22] Filed: Sep. 21, 1978

[51] Int. Cl.² B64C 15/02; B64D 1/06

[52] U.S. Cl. 244/15; 89/1.5 R;
244/45 A; 244/100 A; 244/133; 244/135 R;
244/137 R

[58] Field of Search 244/15, 13, 45 A, 135 R,
244/135 C, 118 R, 119, 133, 137 R, 100 A, 100
R, 14, 89, 90 R, 123; 89/1 A, 1.5 R, 1.5 E

[56] References Cited

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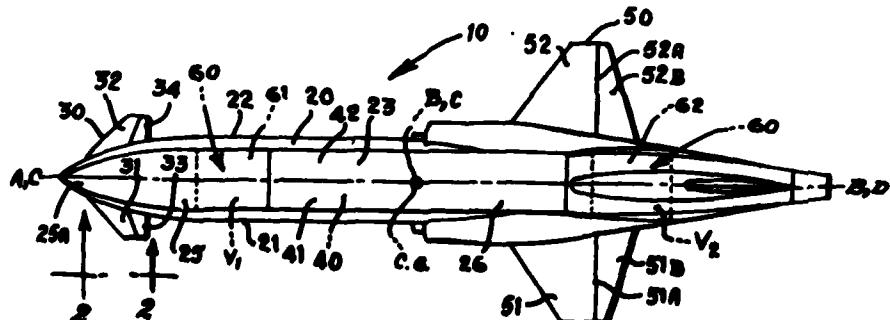
O'Brian et al., "U.S./F.R.G. Advanced Tactical RPV Requirements As Analyzed by Boeing and Dornier", 4th Annual Symposium of the National Association of Remotely Piloted Vehicles, 6/1977, FIGS. 10 & 14.

Primary Examiner—Barry L. Keimacher
Attorney, Agent, or Firm—Joseph E. Rusz; Arsen Tashjian

[57] ABSTRACT

A recoverable remotely piloted vehicle (RPV) having: a deflectable canard/elevator placed very close to the nose tip; a constant (cross) section fuselage; wings mounted low and well aft on the fuselage; elevons; a centrally positioned weapon/payload bay, with doors, located internal of the upper portion of the fuselage; and, inflatable landing skids. The weapon/payload is dropped from the RPV, while the RPV is in flight in an inverted position.

4 Claims, 5 Drawing Figures





PATENT
ABSTRACT

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United States Patent [19]

Barry

[11] 4,194,811
[45] Mar. 25, 1980

[54] REMOTELY CONTROLLED
ELECTROMAGNETIC OPTICAL FOCUSING
ASSEMBLY

[75] Inventor: James D. Barry, Los Angeles, Calif.

[73] Assignee: The United States of America as
represented by the Secretary of the
Air Force, Washington, D.C.

[21] Appl. No.: 902,523

[22] Filed: May 3, 1978

[51] Int. Cl. 2 G02B 7/04

[52] U.S. Cl. 350/255

[58] Field of Search 350/46, 47, 255;

250/201

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Primary Examiner—F. L. Evans
Attorney, Agent, or Firm—Joseph E. Rusz; Arsen
Tashjian

[57] ABSTRACT

A lens of an optical system in space is to be moved, and thereby be focused, resulting in the focusing of the system. The lens is mounted, in a diaphragm of resilient material, with a ring-like component made of magnetic material. An electromagnet is positioned on either side of the lens and of the ring-like component. Application of d.c. current, by remote control, through the electromagnets, causes the translational movement, and the necessary focusing, of the lens and, therefore, of the optical system.

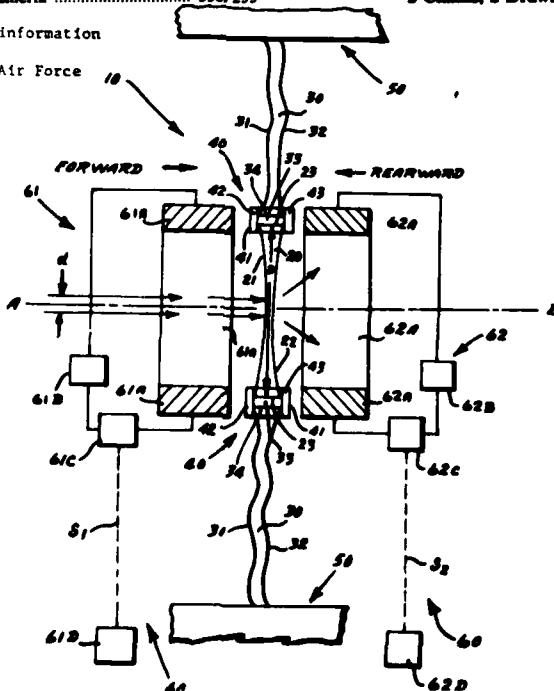
2 Claims, 2 Drawing Figures

[56] References Cited

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